

THIRTY-SEVENTH ANNUAL REPORT

ON THE

NEW YORK STATE MUSEUM OF NATURAL HISTORY,

BY THE

REGENTS OF THE UNIVERSITY

OF THE

STATE OF NEW YORK

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TRANSMITTED TO THE LEGISLATURE JANUARY 10, 1884.

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IN SENATE,

JANUARY 10, 1884.

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THIRTY-SEVENTH ANNUAL REPORT  
OF THE STATE MUSEUM OF NATURAL HISTORY.

UNIVERSITY OF THE STATE OF NEW YORK, }  
OFFICE OF THE REGENTS, }  
TRUSTEES OF THE STATE MUSEUM. }

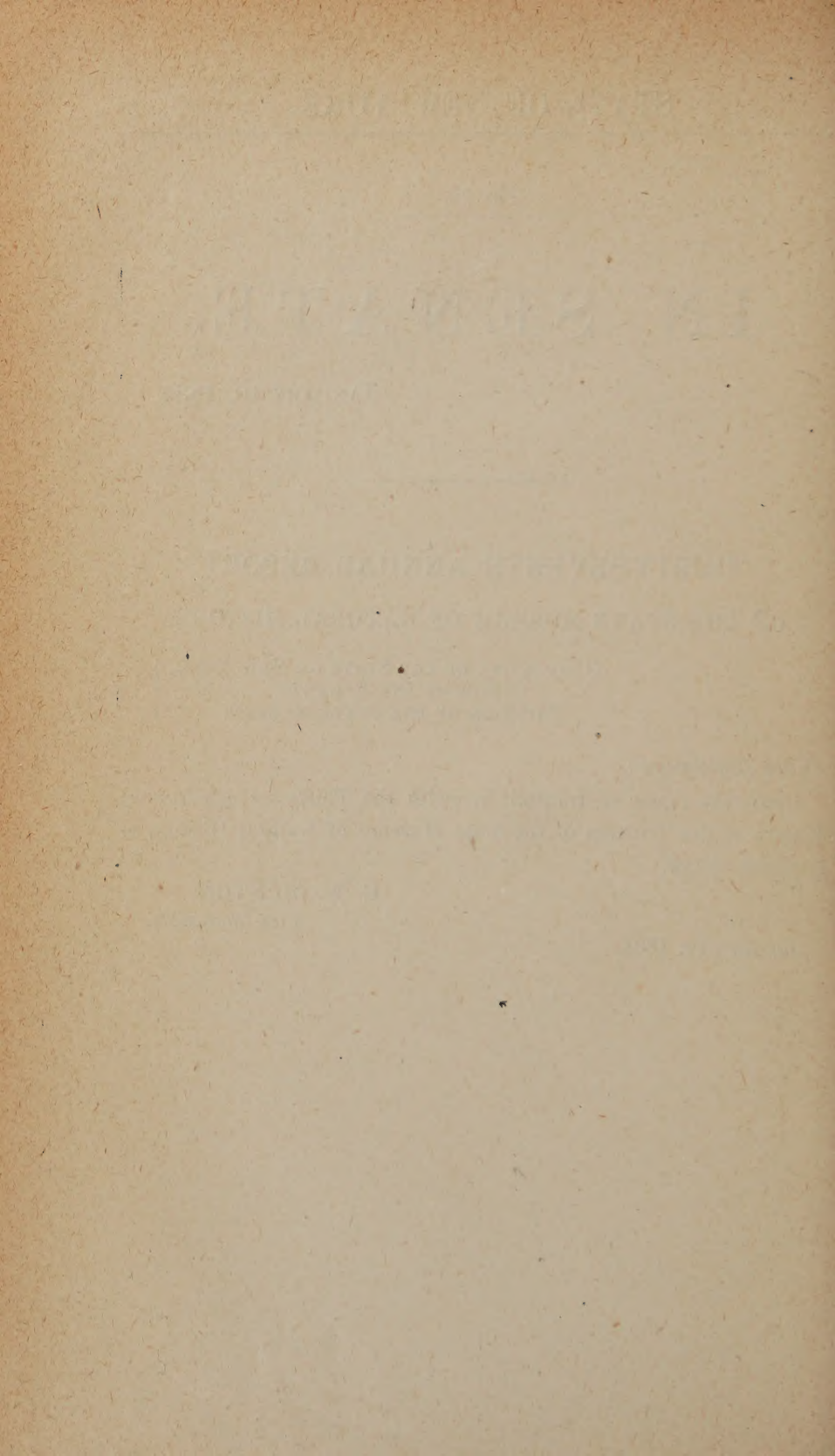
*To the Legislature :*

I have the honor to transmit herewith the Thirty-seventh Annual Report of the Trustees of the State Museum of Natural History, as required by law.

G. W. CLINTON.  
*Vice-Chancellor.*

*January 10, 1884.*







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## REPORT.

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### *To the Legislature:*

The Regents of the University, as trustees of the State Museum of Natural History, respectfully submit their Thirty-seventh Annual Report, as required by law.

The act of the Legislature constituting chapter 355 of the Laws of 1883, imposed new and important duties on the trustees of the museum. They submit the following statement of their proceedings under this law.

The first section of this act directs the trustees to occupy the several rooms of the State Hall for the purposes of the museum as they may be vacated by the present occupants, and to fit up and prepare the rooms in a suitable manner, and to remove thither all the State collections. An appropriation of \$20,000 was made for this purpose. Under this authority the trustees have occupied the basement for the storage of valuable plates belonging to the Palæontology, and for duplicate specimens. They have also used for temporary purposes the rooms in the second and third stories which have become vacant. But until a larger number of rooms in the building is vacated it has been found impossible to commence the work of fitting up the building. The trustees have requested Commissioner Perry to aid and advise them in the preparation of plans for the complete adaptation of the building for the museum. He has accordingly carefully studied the building and has had plans for the work prepared. The work of actual preparation will be begun as soon as any considerable portion of the building is vacated.

The second section of the act provides for a reorganization of the staff and work of the museum. In accordance with this section vesting all the appointments of the staff in the trustees, they reappointed all the members as follows:

Professor James Hall to be State Geologist and Director of the museum.

James W. Hall, general assistant in charge of the zöological department.

John Gebhard, special assistant and guide to the museum.



Charles E. Beecher, assistant in geology and palæontology.

Also they appointed for special departments in the museum the following, viz.:

J. A. Lintner, State Entomologist.

Charles H. Peck, State Botanist.

The trustees in further pursuance of this section have planned and arranged to carry out its purposes by instituting extensive exchange and distributions of their duplicate specimens among the institutions of learning under the Board of Regents. This, however, can only be fully carried out when the duplicates of the collections are brought together in the new museum building. Under the resolution of the Legislature of 1881, collections of named and labeled specimens have been sent on application to the following academies:

1. Perry Union School, Perry, Wyoming county.
2. Baldwinsville Academy, Baldwinsville, Onondaga county.
3. Seymour Smith Academy, Pine Plains, Dutchess county.
4. Waterville Union School, Waterville, Oneida county.
5. Dreanan Literary Institute, Franklin, Delaware county.
6. Phelps Union and Classical School, Phelps, Ontario county.
7. Little Falls Union School, Little Falls, Herkimer county.
8. Port Byron Free School and Academy, Port Byron, Cayuga county.
9. Glens Falls Academy, Glens Falls, Warren county.
10. Weedsport Union School, Weedsport, Cayuga county.
11. Dryden Union School, Dryden, Tompkins county.
12. Olean Free School and Academy, Olean, Cattaraugus county.
13. Rutgers College, New Brunswick, New Jersey.
14. Warsaw Union School, Warsaw, Wyoming county.

The law provides that the trustees of the museum shall hereafter be authorized to print, under their own direction, the scientific papers prepared by the staff of the museum. As the increased appropriation called for by these enlarged duties has not yet become available, the trustees have been unable to enter upon the work of printing scientific papers. This they expect to undertake during the coming year, and they look forward with satisfaction to the prospect of issuing from the museum, from time to time, the important and valuable results of their investigations.

By the third section of the law the trustees are charged with the work of supervising the completion of the Palæontology. It is provided that one volume of the work shall be issued each year during five years, and that the completed work shall consist of those five volumes. The trustees, in preparing to execute this part of the law, have found existing contracts for the printing and engraving required

this work. They sought the opinion of the Attorney-General as to the binding force of these contracts, and were advised that the contracts held by Charles Van Benthuyzen & Sons were valid, and gave to them the right to execute the printing and engraving for the remaining volumes of the Natural History of the State. They obtained, however, extensive and advantageous modifications of the terms of these contracts, and executed a new and supplementary contract for the due execution of the work under the conditions imposed by the law.

They also made a contract with Professor James Hall for the execution of the drawings necessary for the plates to be engraved, and for the preparation of the text and explanations of the plates, and for the supervision of the work.

These contracts with Charles H. Van Benthuyzen and with James Hall are herewith transmitted for the information of the Legislature.

Under these contracts the work of preparing a new volume of the Palæontology was resumed, and has been pushed forward with all possible speed. It is expected that this volume will be ready for delivery in February of the present year, and a second volume will be ready by January, 1885.

The volumes of the Palæontology owned by the State, and not yet sold or distributed, have been handed over to the custody of the trustees of the museum, and the proceeds of the sale of volumes are placed to the credit of the museum library.

The trustees in closing this report desire to make grateful mention of the several members of the museum staff, for the faithful and efficient manner in which they have performed their arduous duties.

We respectfully refer for a fuller account of the operations of the several departments of the museum, to the reports of the Director, and of the State Entomologist and State Botanist, which are herewith transmitted.

The value of the services of these officers will be particularly evident from the recital there given of their work. The State Entomologist has during the past summer been called upon to aid in the threatened invasion of the northern counties of the State by the chinch-bug, one of the most destructive pests of agriculture. The value of Professor Peck's contributions to botany is indicated by the constant demand received for copies of his contributions to the past annual reports of the museum.

Respectfully submitted,

G. W. CLINTON,  
*Vice-Chancellor.*  
DAVID MURRAY,  
*Secretary.*







## CONTRACTS.

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An Act to regulate the State Museum of Natural History and the publication of the Palæontology of the State.

*The People of the State of New York, represented in Senate and Assembly, do enact as follows :*

SECTION 1. For the purpose of providing sufficient and fire-proof accommodations for the collections of natural history belonging to the State, the Regents of the University, as trustees of the State Museum of Natural History, are hereby directed, in pursuance of the concurrent resolution of the Legislature, passed on the twenty-fourth day of March, eighteen hundred and eighty-one, to occupy, for the purposes of said museum, the several rooms of the State Hall as they may be vacated by their present occupants; and said trustees are hereby directed to fit up and prepare said rooms in a suitable manner, and to remove thither and arrange in order for exhibition, as soon as may be, the collections of said museum; said trustees shall also make provision for and remove to said State Hall, to be a part of said museum, all the fossils, minerals and other property of the State now in the charge of the State Geologist, in pursuance of the provisions of chapter two hundred and seventy of the laws of eighteen hundred and eighty-two; and the sum of twenty thousand dollars, or so much thereof as may be necessary, is hereby appropriated for the expenses of fitting up and removal, as provided in this section, to be paid on vouchers approved by said trustees.

§ 2. The scientific staff of the museum, to be appointed by said trustees, shall consist of a Director, who may also be State Geologist, and whose compensation shall be the same as now fixed by law, and of three assistants, together with such special assistants as may be necessary, whose compensation shall be fixed from time to time by said trustees, together with the State Geologist, State Entomologist and Botanist as these officers are now defined and provided for by law; and all the collections made by the members of said staff during their terms of service shall belong to and form a part of the collections of the museum; and the trustees of said museum shall be authorized to publish each year the scientific contributions of said staff and such other original scientific contributions as they may deem expedient, which publication shall be in lieu of the reports now required by law from the State Geologist and State Entomologist, and the scientific papers communicated each year to the Legislature along with the annual report of said trustees; and it shall be the duty of said trustees to distribute from the duplicate specimens of the museum to institutions of learning such collections as may be available and suitable for

that purpose, as directed by a concurrent resolution of the Legislature passed on the fourteenth day of March, eighteen hundred and eighty-one, and to provide facilities in the museum for the study of its collections, and by means of printed hand-books describing said collections, and in such other ways as may be practicable, to make said museum a means of instruction to the citizens of the State. In order to provide for the expense of printing the aforesaid scientific publications and in order to increase the usefulness and efficiency of said museum as aforesaid, the annual appropriation to be made for its maintenance shall be fifteen thousand dollars, to be paid on vouchers approved by said trustees.

§ 3. The trustees of the State Museum of Natural History are hereby appointed to supervise the completion of the publication of the Paleontology of the State, to contract for the preparation and printing thereof, and to audit and certify to the expenditures therefor; and it is hereby provided that one volume of said Paleontology shall be published within one year from the execution of the contract for its preparation, that a second volume shall be published within two years, and that the entire work shall not extend beyond five bound volumes in addition to those already issued, all of which shall be published within five years from the passage of this act, and shall comprise the following subjects, that is to say, the *Lamellibranchiata* to be bound in two volumes, the *Bryozoans* to be bound in one volume, the *Brachiopoda* to be bound in one volume, and the *Crustacea, et cetera*, to be bound in one volume; and the sum of fifteen thousand dollars shall be appropriated annually for five years for the purposes of this section payable on vouchers certified by said trustees; which sum of fifteen thousand dollars, or so much thereof as may be necessary, is hereby appropriated out of any money in the treasury not otherwise appropriated for the purpose of said publication for the current year.

§ 4. The volumes of the Natural History hereafter to be published, and the copies still remaining of the volumes already published, shall be in the charge of the trustees of said museum, who shall distribute and sell the same in accordance with the provisions of law now in force for such distribution and sale, and the proceeds of such sale said trustees shall use for the purpose of forming a suitable library for said museum, and they shall have authority to make exchanges with such portion of the volumes of said work as are not required for distribution or sale, and to receive donations and deposits of books and specimens on such terms as they shall deem advantageous for said museum.

CONTRACT BETWEEN THE STATE OF NEW YORK BY THE TRUSTEES  
OF THE STATE MUSEUM OF NATURAL HISTORY AND CHARLES H.  
VAN BENTHUYSEN.

Memorandum of agreement made this twenty-eighth day of July, 1883, between the State of New York, by the Regents of the University acting as trustees of the State Museum of Natural History, pursuant to chapter 355 of the Laws of 1883, and Charles H. Van Benthuyssen, printer, of the city of Albany, witnesseth:

WHEREAS, The State of New York, by William C. Bouck, Governor, entered into a contract on the fourth day of April, 1843, with Thomas

B. Carroll and Alanson Cook, for printing and binding the Natural History of the State of New York, and on the twenty-seventh day of July, 1847, by John Young, Governor, entered into a contract with Richard H. Pease for the lithographic engravings of the drawings requisite for completing the Natural History of the State of New York; and

WHEREAS, On the fifth day of October, 1871, the State of New York, by Homer A. Nelson, Secretary of State, and Samuel B. Woolworth, Secretary of the Board of Regents acting pursuant to chapter 717 of the Laws of 1868, entered into a further contract with Charles Van Benthuyzen, printer, of the city of Albany, assignee of the two aforesaid contracts for the continuation of the work to be performed in publishing the aforesaid Natural History; and

WHEREAS, The execution of the said contracts was transferred to the firm of Charles Van Benthuyzen & Sons, composed of Charles Van Benthuyzen, Charles H. Van Benthuyzen and Arthur L. Van Benthuyzen; and

WHEREAS, By the death of the said Charles and Arthur L. Van Benthuyzen, the said Charles H. Van Benthuyzen, as the survivor, has succeeded to the rights and obligations of said firm under said contract; and

WHEREAS, Elizabeth Root Van Benthuyzen, widow and executrix of the will of late Charles Van Benthuyzen, has by a writing hereon indorsed in behalf of herself and the estate consented to certain modifications of said contract hereinafter described,

*Now, therefore,* it is hereby agreed by the aforesaid trustees and Charles H. Van Benthuyzen, his heirs and assigns, that the said Van Benthuyzen shall execute, as hereinafter described, the work required under the aforesaid contracts for the publication of the remaining volumes of the Palæontology of the State, as defined in section three of chapter 355 of the Laws of 1883, and the publication of said volumes of Palæontology as therein defined, shall constitute the completion of the publication of the Natural History of the State of New York, as provided for by the aforesaid contracts; that is to say, the said Van Benthuyzen shall print in letter-press the text of said Palæontology from good and clear type on paper of thirty-five pounds to the ream, and the explanations of the plates on paper of sixteen pounds to the ream, substantially as per samples herewith, and he shall execute in good style for said text to be printed therewith the wood cuts required for illustrations, not to exceed one hundred in all the volumes; he shall print in lithography the residue of the plates for said work, as hereinafter described, on Tileston's best plate paper, weighing eighty-five pounds to the ream, as per sample herewith, and he shall bind the said work in full cloth with title on back, and sides stamped in gold and black, and the printing, lithography and binding in style and execution shall be in all respects equal and conformable to those of the volume last published, entitled volume five, part two of Palæontology, except that no engraved title-page with vignette shall be required in any of the volumes hereafter to be printed; said work shall be printed in five volumes, three thousand copies of each, to contain in all not more than one thousand three hundred and seventy-five pages of text,



together with the plates and explanations belonging thereto, said explanations to be printed, when the matter so requires, in double column or on both sides of the sheet; the volumes of said work shall consist as fixed by law of the following, that is to say :

There shall be two volumes on Lamellibranchiata, to contain together about four hundred and fifty pages of text and ninety-six plates, of which seventy-eight plates are already printed and are in the possession of said trustees, and eighteen plates, to contain three hundred and twenty-five figures, are to be lithographed and printed by said Van Benthuyzen, for which there shall be printed also ninety-six leaves of explanations to face said plates ; there shall be one volume on Bryozoa, to contain about three hundred pages of text, and sixty-eight plates, of which thirty-three plates have been printed and are now in the possession of the said trustees, and six plates, containing one hundred and twenty-seven figures, have been drawn on stone and are to be proved and printed, and twenty-seven plates, to contain five hundred and sixty-three figures, are to be lithographed and printed, and sixty-six leaves of explanations to face said plates are to be printed ; there shall be one volume on Crustacea (including also matter Pteropoda and Cephalopoda), to contain about three hundred and twenty-five pages of text, and sixty-six plates, of which twenty-two plates have been printed and are now in the possession of said trustees, four plates, containing sixty-eight figures drawn on stone and proved, are to be printed, and forty plates, to contain five hundred and forty figures, are to be lithographed and printed, and sixty-six leaves of explanations to face said plates are to be printed ; there shall be one volume on Brachiopoda, to contain about three hundred pages of text and fifty-seven plates, of which twenty-seven plates have been printed and are now in the possession of said trustees, and thirty plates, to contain nine hundred and five figures, are to be lithographed and printed, and fifty-seven leaves of explanations are to be printed : it is further agreed that said trustees shall furnish to said Van Benthuyzen the drawings for the plates of the several volumes in such order and quantity as may be required for the due completion thereof, as hereinafter described, and the last of said drawings for each volume shall be furnished at least two months before the specified time of its delivery, all proofs of such plates to be approved by the said trustees or their authorized agent, and the printed sheets of said plates to be delivered to and receipted for by said trustees or agent ; the said trustees shall also furnish, in a fair and legible condition, the manuscript copy in such quantity and at such times as will enable the said Van Benthuyzen to comply with the terms of this agreement, the last installment of copy for each volume to be furnished at least two months before the time herein specified for the delivery of such volume ; the said Van Benthuyzen shall furnish one proof, three copies, and one revise, three copies, to be returned within four working days from receipt thereof. It is further agreed that said trustees shall furnish to said Van Benthuyzen the copies of the printed plates for the several volumes in their possession as they may be required for binding, and said Van Benthuyzen shall deliver to said trustees at the times herein specified three thousand copies of each of said volumes, containing the text,

plates and explanations as hereinbefore described, provided that as one hundred copies of each of the plates of the Lamellibranchiata up to and including number eighty, except numbers thirty-five and forty-two, have been appropriated to use by said trustees, it shall constitute a full delivery on the part of the said Van Benthuyssen, when he shall have delivered two thousand nine hundred complete copies of each of the two volumes of Lamellibranchiata and one hundred copies of a bound volume containing the text and the remaining plates; the times for the delivery of the several volumes herein specified shall be as follows, that is to say, the first volume on Lamellibranchiata not later than February 15, 1884; the second volume on Lamellibranchiata not later than January 1, 1885; the volume on Bryozoa not later than May 1, 1886; the volume on Crustacea, etc., not later than May 1, 1887, and the volume on Brachiopoda not later than August 1, 1888; it is further agreed that the said Van Benthuyssen shall be paid from the treasury of the State for the work herein described as follows, that is to say, for the first volume on Lamellibranchiata, six thousand seven hundred and forty-four and thirty-six one-hundredths dollars; for the second volume on Lamellibranchiata, ten thousand four hundred and two and eighty-seven one-hundredths dollars; for the volume on Bryozoa, fifteen thousand and sixteen and twenty one-hundredths dollars; for the volume on Crustacea, etc., sixteen thousand nine hundred and thirty-two and eighty-eight one-hundredths dollars; and for the volume on Brachiopoda, fifteen thousand nine hundred and three and sixty-nine one-hundredths dollars; making a total of sixty-five thousand dollars, to be paid in the manner following, that is to say, for the work of lithography, as herein described, on the presentation from time to time of detailed bills in which the work executed for each separate volume shall be separately stated, he shall be paid for such work at the rate of eighty-eight per cent of the prices fixed in the contract made in 1871 between the State of New York and Charles Van Benthuyssen; and on the completion of the printing and binding and the delivery of each of the several volumes, he shall be paid such further sum as when taken together with the sums paid for the lithography of such volume shall amount in the case of each volume to the aggregate sum hereinbefore specified for such volume; and said sums shall be in full payment for all the work done in pursuance of this agreement; it is further agreed in case the Legislature shall fail to make the appropriations for the continuance of the work herein described, or in case of the death or disability of the author or authors employed for its preparation, that the work shall be suspended and that all the parts of any volume or volumes which shall have been printed, together with the plates and explanations therefor, shall be delivered to the said trustees, and so far as appropriations may be available, payment shall be made for the same in accordance with the terms herein described, and the balance not so paid shall constitute a just claim against the treasury of the State.

In witness whereof and in pursuance of the authority conferred by the third section of chapter three hundred and fifty-five of the Laws of 1883, the Regents of the University, acting as trustees of the State Museum of Natural History, have

[L. s.] caused their common seal to be hereon impressed, and the Chancellor and Secretary have hereto subscribed their names, and the said Charles H. Van Benthuyzen has also hereto subscribed his name and affixed his seal this twenty-eighth day of July, 1883.

(Signed)

H. R. PIERSON,  
Chancellor.  
DAVID MURRAY,  
Secretary.

CHARLES H. VAN BENTHUYSEN. [L. s.]

In consideration of the sum of one dollar in hand paid by the parties to the within contract, the receipt of which is hereby acknowledged, I hereby consent to the contract.

(Signed) E. R. VAN BENTHUYSEN. [L. s.]

CONTRACT BETWEEN THE STATE OF NEW YORK, BY THE TRUSTEES OF THE STATE MUSEUM OF NATURAL HISTORY, AND JAMES HALL, STATE GEOLOGIST.

Memorandum of agreement made and entered into this first day of September, A. D., 1883, by and between the people of the State of New York, by the Regents of the University of the State of New York, acting as Trustees of the State Museum of Natural History, pursuant to section three of chapter three hundred and fifty-five of the Laws of 1883, and James Hall, State Geologist, of the city of Albany.

Witnesseth, that whereas it is provided by said act that the trustees of the State Museum of Natural History shall supervise the completion of the publication of the Palæontology of the State; contract for the preparation and printing thereof, and audit and certify to the expenditures thereof, and that one volume of said Palæontology shall be published within one year from the execution of the contract for its preparation; that a second volume shall be published within two years, and that the entire work shall not extend beyond five bound volumes in addition to those already issued, all of which shall be published within five years from the passage of this act, and shall comprise the following subjects, that is to say, the *Lamellibranchiata*, to be bound in two volumes; the *Bryozoa*, to be bound in one volume; the *Brachiopoda*, to be bound in one volume, and the *Crustacea, et cetera*, to be bound in one volume; now, therefore, it is hereby agreed by and between the parties aforesaid that the said Hall shall prepare and furnish all the text and description of plates required by each and all of the aforesaid volumes on Palæontology, and shall deliver the manuscript thereof in suitable installments and in a fair and legible condition to the printer, and shall correct and return within four working days the proof of the same as it may be delivered to him by the printer; that the said Hall shall also make or procure to be made by competent draughtsmen and furnish to the lithographer all the drawings of fossils



which may be required for said volumes, and shall supervise the work of lithographing said drawings; shall inspect and approve the proofs of plates and the paper to be used in printing said plates, and shall receive from and receipt to said lithographer for the printed plates as they may be delivered to him; it is further agreed that the said Hall shall furnish to the printer the manuscript of the text and the drawings for the plates and the manuscript of the descriptions of the plates for the several volumes, in such order and within such reasonable time as may be required for the due printing and delivery of the same at the dates hereinafter fixed, the last installment of said manuscript of text and descriptions of plates and of said drawings for each of said volumes to be furnished to said printer not later than two months before the date so fixed; and that the dates of the delivery of the several volumes to the said trustees shall be as follows, that is to say, the first volume on *Lamellibranchiata* by the fifteenth day of February, 1884; the second volume on *Lamellibranchiata* by the first day of January, 1885; the volume on *Bryozoa* by the first day of May, 1886; the volume on *Crustacea, et cetera*, by the first day of May, 1887, and the volume on *Brachiopoda* by the first day of August, 1888; and it is further agreed that for the services as aforesaid the said Hall shall be paid as follows, that is to say, as compensation for authorship and including the correction of proof and the supervision of the drawing and lithography as herein described, the sum of twelve hundred dollars per annum for five years; as compensation for an assistant to be employed by the said Hall for the purpose of aiding in the preparation of said work a sum not to exceed one thousand dollars in any one year, to be paid on vouchers certified by said Hall; and as compensation for the execution of the drawings required for said volumes to be executed under his supervision and subject to his approval by persons to be employed by him, there shall be paid from time to time upon vouchers certified by him such sums as may be required, not to exceed in the aggregate for all the remaining drawings, three thousand dollars, and at a rate not to exceed on an average the sum of three and one-half dollars for each figure so drawn; and whereas, under chapter two hundred and seventy of the Laws of 1882, and under chapter two hundred and forty-three of the Laws of 1883, appropriations are made for James Hall as State Geologist for compensation for authorship and superintendence of drawings and engravings and for persons employed in making drawings, it is further covenanted and agreed that whatever sums are received from the State by the said Hall after the date hereof, on account of services for authorship and superintendence of drawings and engravings or for expenditures for persons employed in making drawings under the aforesaid acts, or under any future acts of appropriation available during the time of this contract, other than those in pursuance of said chapter three hundred and fifty-five of the Laws of 1883, first above referred to, shall be credited to the payments herein stipulated to be paid to said Hall for such services and expenditures, and shall be in place of payments made from the appropriations provided in and in pursuance of the aforesaid chapter three hundred and fifty-five of the Laws of 1883; and it is further agreed, in case the

work herein described shall be suspended in consequence of the failure of the Legislature to make appropriations for its continuance, or for any other cause, that the said Hall shall deliver to the said trustees all the parts of the manuscripts of the text and descriptions of plates and of the drawings for said plates so far as the same have been prepared, and so far as appropriations may be available payment shall be made for the same in accordance with the terms herein described, and the balance not so paid shall constitute a just claim against the treasury of the State.

In witness whereof, and in pursuance of the authority conferred by the third section of chapter three hundred and fifty-five of the Laws of 1883, the Regents of the University, acting as trustees of the State Museum of Natural History, [L. S.] have caused their common seal to be hereon impressed, and the Chancellor and Secretary have hereto subscribed their names and the said James Hall has also hereto subscribed his name and affixed his seal this first day of September, 1883.

(Signed)

H. R. PIERSON,  
*Chancellor.*  
DAVID MURRAY,  
*Secretary.*

JAMES HALL, [L. S.]  
*State Geologist.*

## REPORT OF THE DIRECTOR.

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ALBANY, *January*, 1884.

*To the Honorable the Board of Regents of the University of the State of New York :*

GENTLEMEN — I have the honor to communicate herewith the annual report upon the State Museum of Natural History for the year 1883, being the thirty-seventh in consecutive order, together with a statement of the condition of the collections in the several departments, with the additions made thereto, and a general account of the work done in the institution during the past year.

Since the communication of the thirty-sixth report considerable progress has been made in the publication of the reports subsequent to the thirty-first. The thirty-second report had already been issued as a legislative document, but no copies have been published for the use of the Regents or of the museum. The thirty-third and thirty-fourth reports have been printed and delivered at the museum and State library for general distribution. The thirty-fifth report is nearly printed ; already more than four hundred pages are in type and it will speedily be issued. This report will contain several scientific papers, which were communicated with the thirty-third and thirty-fourth reports, and will also include the several catalogues of shells which had been communicated with preceding reports and not heretofore printed. The thirty-sixth report will follow without delay, and we have reason to believe that within the present year the reports will be printed up to date. This work once accomplished will relieve the museum of much unpublished matter which has accumulated from year to year, and has left the actual work and condition of the museum unrepresented in the printed reports.

The collections of the museum have been preserved in their usual good order and condition, and all available space and facilities have been given to their exhibition. The anticipated early removal of the collections to the State Hall has rendered it undesirable to make any unusual plans for placing material on exhibition, which at best could only be of temporary service.

The skeleton of the whale mentioned in my two preceding reports has been received in good order and is now stored in one of the basement rooms of the State Hall. The specimen is ready for mounting and placing on exhibition as soon as a suitable place can be provided.



The collections of birds and mammals, formerly in charge of the Taxidermist, Mr. James A. Hurst, have, since the death of the latter, been placed in charge of Dr. J. W. Hall, assistant in the museum, who, for the past two years, has had entire charge of these collections. During the past month these collections have been removed from their cases, carefully cleaned and examined, and replaced in the cases in good order, and are all reported as entirely free from injurious insects. The skeletons of birds, fish and mammals have likewise received the proper treatment for their preservation and have been replaced in their proper cases. The alcoholic collections have also been critically examined, the jars refilled, and the whole restored to the cases in proper order.

Since the date of my last report the mineralogical collection has been removed from the shelves, the specimens and cases cleaned, and the minerals returned to their places. The geological collection in the wall cases has been likewise removed and properly cleaned and returned to their places. The catalogue of the mineralogical collection has been completed and will accompany this report.

The cleaning and rearrangement of this part of the museum collection has more clearly revealed the fact, which we knew before, that the collection of minerals, in its representation of New York localities, is far behind the discoveries of later years, and imperatively requires attention. I would recommend that some attention be given to improving this department of the collection. This can be most readily and economically done by the purchase of collections at the localities, or the employment of some person living on the ground where these minerals have been discovered and who will obtain them for a much less cost than can be done by sending collectors into the field.

The additions to the museum collections made during the year 1883 will be found recorded in detail in the lists appended.

In the botanical department specimens have been received from seven contributors.

In the collections of zoölogy and ethnology additions are recorded from eight contributors, and there are three contributors to miscellaneous collections.

To the collections of geology, mineralogy and palæontology specimens have been received from eleven contributors.

The library has received from all sources one hundred volumes and pamphlets; of these, six have been purchased.

#### COLLECTIONS IN THE FIELD.

During the spring of 1883, the excavations made in cutting the West Shore railroad through the Utica and Hudson river slates at a point about three miles below Albany enabled the museum to secure a large collection of graptolites from these beds. The collection embraces several thousand specimens, and many of these are large slabs covered with these organisms. The black slates of this locality have conserved the organic remains in an unusual condition of perfection, compared with most of the localities of the slates in the Hudson valley. From this abundant and well-preserved material there may be ob-

tained valuable data for an instructive paper of the graptolites, especially as to the development of the base or initial point of the organism.

The collection is so extensive in number of specimens that the museum may well supply to other similar institutions a share of its duplicates.

The Curator has considered it desirable to make some farther investigation in regard to the relations of the Oneonta sandstone and the underlying rocks, a problem of much importance in the geological record of the State, and one which requires still farther inquiry before a satisfactory determination can be made. Geological sections and collections were made in the counties of Delaware, Otsego, Chenango and Madison. These collections illustrate the order of succession among the strata in several localities, and will be of use in the final comparisons and determination of this question.

During the past summer it became necessary to verify some former observations upon the relations of the Niagara and Lower Helderberg groups, with the Hudson River group in the neighborhood of Catskill, which had heretofore been published in the New York reports, and which more recently had been controverted. The observations especially made sustain the views formerly published regarding the unconformability of the higher groups with the Hudson River group below, still leaving, however, a wide field for further investigation and the determination of many interesting questions regarding the geological dynamics of the periods named.

#### CURRENT WORK OF THE MUSEUM.

In addition to the current work pertaining to the care and preservation of the several collections of the museum, the catalogue, etc., as already mentioned, other work has been going on for the advancement of the museum collections.

The work of cutting translucent sections of fossils for mounting on glass, and of cutting and polishing other fossils for illustrating their structure, as well as cutting and shaping specimens for illustration and for placing in the cases, has been carried on as usual.

The total number of translucent sections of rocks and fossils cut and mounted on glass during the year is about 213. Specimens of fossils cut and shaped, ground for resting on shelf or block, and polished, number 360.

Taking advantage of our facilities for cutting and polishing specimens, the authorities of the normal school at Cortland sent to the museum a considerable number of specimens of fossils from their collections proposing that these be cut and polished, and the museum retain a part of the material thus acquired, as payment for the labor bestowed. The proposition was accepted and the work done; a part of the collection has been returned to the normal school at Cortland, and the museum retained forty-five specimens, which are enumerated in the list of additions to the museum collections. Both institutions have profited by this intercourse, and the Curator would be glad to extend to any of our educational institutions similar facilities.

An arrangement similar to the above has been made with E. B. Knapp, Esq., of the Skaneateles Library and Scientific Association, who has sent a considerable collection of cyathophylloid fossils for cutting, conditioned on receiving a portion of them in return, for the use of the Library Association. Since this arrangement will accrue to the advantage of students of natural science, the Curator has had no hesitation in making the agreement.

The entire collection of translucent sections of rocks and fossils, on glass slides, has been numbered and labeled; each section has the catalogue number and name written on the glass with a preparation of asphalt. A catalogue of these specimens, numbering more than two thousand, will accompany the present report as an appendix.

#### LAMELLIBRANCHIATA.

In the fossil Lamellibranchiata the duplicate specimens of the families PECTINIDÆ, PTERINIDÆ, AVICULIDÆ and MYTILIDÆ have been arranged and labeled preparatory for selection and distribution, and now await the publication of volume V, part 1 of the Palæontology of New York. The remainder of the collection of Lamellibranchiata will be arranged and labeled during the present year.

#### BRACHIOPODA.

The application of photo-micrography has been made to the illustration of the microscopical sections of the fossil Brachiopoda, prepared by Mr. C. E. Beecher, and has been carried on by him far enough to demonstrate its entire applicability to the objects sought to be accomplished. From what has already been done in this direction it is evident that the results are very important to the study and classification of the Brachiopoda, and that photography can be very successfully applied in the representation of the minute structure of fossil organisms.

Already something more than three hundred of these microscopic slides have been prepared, from which more than seventy photo-micrographic illustrations have been made. The negatives are the property of the State Museum. A print from each one will be mounted in a suitable book for study and reference, and, with the microscope slides will form the typical series for future reference in all studies of the Brachiopoda.

The success attending this experiment is already much greater than I could have expected, and I confidently anticipate that the coming year will show a greatly increased amount of material prepared, as well as improved results from the application of the photo-micrographic process.

#### DISTRIBUTION OF DUPLICATE COLLECTIONS.

Collections averaging one hundred species each have been sent to the following institutions:

Port Byron Free School and Academy.  
Glens Falls Academy.



Weedsport Union School.

Dryden Union School.

Olean Free School and Academy.

Rutgers College, New Brunswick, New Jersey. In exchange.

I would be glad to recommend that some steps be taken to arrange, according to generic and specific order, the duplicate fossils of the museum collections. Many of these are now packed in boxes and are only accessible with difficulty whenever a small collection is desired for distribution to school or academy. In such difficulty it is natural to seek those most accessible, and in this manner we may often send away specimens in the smaller series which it would be desirable to reserve for more important collections.

The completion of volume V, part 1, on the Lamellibranchiata will enable us to give authentic names to a large number of these fossils. The collections from New York are much greater than from any other State in the Union, and the volume now in press will give a greater amount and variety of palæozoic forms than have yet been published in any country of America or Europe from the same formation.

I would beg leave to suggest that certain sets of these duplicates be set aside for exchange or presentation to some of the foremost museums in Europe. In either case, were these collections in the museums of Europe, it would lead to a clearer and higher appreciation of the work which we have done, and make the work still more emphatically one of authority in geological science.

Such a course would serve to open an intercourse between the State Museum and the more important museums of Europe, a feature which I feel will be an important one for ourselves and will serve to facilitate the future working of the institution.

I would also beg leave to call your attention to the fact that there are several very valuable collections in the State Museum which in case of loss could not be replaced. In view of the conceded unsafe condition of the present museum building, I would recommend that the following collections be at once removed to the State Hall and placed in some room of which the officers of the museum have entire control.

It is not necessary that these collections be displayed in cases, but they may be placed in closed cases or drawers until the new rooms shall be finished for their reception :

(a.) The typical series of specimens of the Cephalopoda, used in the preparation of volume V, part 2, of the Palæontology of New York. The collection numbers between eight and nine hundred specimens, and is partially arranged under glass and partially in drawers.

(b.) The collection of Gould's types of Mollusca.

(c.) The Emmons collection of crystallized minerals.

(d.) The Waldron series of Niagara fossils, of which many are types.

(e.) The collection of translucent sections of rocks and fossils, numbering more than three thousand specimens.

(f.) The typical collection of Gasteropoda and Pteropoda of volume V, part 2, Palæontology of New York, are in the custody of the Curator, as no available space has yet been assigned for their reception.

(g.) At the completion of volume V, part 1 (now in press), the extensive collections of Lamellibranchiate shells which have been used in the preparation of this work will be available for incorporation with State Museum collections.

## GENERAL SUMMARY FOR 1883.

### CURRENT WORK OF THE MUSEUM.

<i>Transparent sections</i> of rocks and fossils mounted on glass, about.....	225
Specimens of fossils shaped, cut, ground and polished, about...	360

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585

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Arranging and cataloguing the above sections.

*Whale skeleton*.— Completed, parts fitted and ready for mounting, at present stored under cover and in safety.

*Geological surveys*, sections and collections made in the counties of Delaware, Otsego, Chemung and Madison.

*Arrangement* and care of zoölogical collections, birds and mammals. The rearrangement, cleaning and numbering specimens in accordance with their present labels.

*Records of library* and of additions to the general collections.

*Rearrangement*, cleaning, etc., of collections of skeletons, and fish, both dry and alcoholic specimens.

*Cleaning, ticketing* and recording the general collection of minerals on second floor.

*Arranging and cleaning* the collection of New York minerals, already recorded.

*Cleaning and arranging* all geological collections and cases on first floor.

The *examination, analysis* or *partial analysis* of several hundred specimens, which are sent to the museum for the determination of the presence of gold or silver.





# ADDITIONS TO THE STATE MUSEUM DURING THE YEAR 1883.

## BY DONATION AND PURCHASE.

### I. BOTANICAL.

#### 1. *By donation.*

Specimens of the garden wache, *Atriplex hortensis*, L. From Mrs. S. M. Rust, Syracuse, N. Y.

Specimens of *Stellaria pubera*, Mx. and *Rhodora Canadensis*, L. From Mrs. I. B. Sampson, Albany, N. Y.

Specimens of three fungi, *Agaricus trullisatus*, Ellis; *Lenzites betulina*, Fr. and *Geaster hygrometricus*, Pers. From Mrs. C. M. Ferry, Oneida, N. Y.

Specimens of Herb Robert, *Geranium Robertianum*, L., with white flowers. From F. W. Battershall, Clyde, N. Y.

Specimens of ten species of fungi. From Professor W. G. Farlow, Cambridge, Mass.

Specimens of sixteen species of fungi. From A. B. Seymour, Cambridge, Mass.

Specimens of *Oidium irregulare*, Pk. From Wm. Trelease, Madison, Wis.

Double branch of tree, one growing through the other. From Delavan Manning, Glenn, Montgomery county, N. Y.

### II. ZOÖLOGICAL.

#### 1. *By donation.*

One hundred specimens of sea shells from Point de Galle, island of Ceylon. From W. Stephen de Silva.

Piece of a pine board from the roof of the Emmanuel Baptist Church, mined by an insect — *Xylocopa Virginica* — the Virginia carpenter bee. From Wm. S. Wheeler, Albany, N. Y.

Australian bird. From Henry W. Koon, Poestenkill, Rensselaer county, N. Y.

Seven specimens of hawk eggs. From E. G. Nott, Buffalo, N. Y.

Specimen of Florida gallinule, shot about ten miles south of Schenectady. From Allen Dewitt Weaver, Albany, N. Y.

A live specimen of green heron, from August Rode, Bethlehem, Albany county, N. Y.

#### 2. *By purchase.*

Skeleton of *Rorqualis borealis* or Fin-back whale.

## III. GEOLOGICAL AND MINERALOGICAL.

1. *By donation.*

*Nautilus*, *n. sp.* Tully limestone, Penn Yan, N. Y.

“ “ “ “ “

*Orthoceras*, *n. sp.* “ “ “

*Cyrtoceras*, *sp. ?* “ ? “

From Wm. Coon, Esq., and Wm. W. Buxton, Esq., Milo Centre, N. Y. Communicated through Mr. Berlin H. Wright, Penn Yan, N. Y.

Petrified wood from Dakota. From Miss Bessie Young, Troy, N. Y.

Eighteen specimens, mostly *Stromatopora*, Lower Helderberg group.

One specimen — *Eridophyllum*, Upper Helderberg group.

One specimen *Chaetetes* — Upper Coal Measures. From C. E. Beecher.

Four specimens of *Pleurotomaria sulcomarginata*.

Two specimens of *Lamellibranchiata* — specimens of *Oneida* conglomerate and tufa. From Mrs. E. M. Ferry, Oneida, N. Y.

Box of iron ore from Essex county, by collection by Prof. James Hall.

Crystal of Gypsum from Frank M. Greenwood, Newark, Wayne county, N. Y.

Compact talc from Gouverneur, N. Y. Used to adulterate paper. From Willard R. Fox, Albany, N. Y.

Specimen of oil-bearing rock. From C. V. Barse, Olean, N. Y.

Rose quartz and feldspar. From W. R. Derby, Essex county, N. Y.

Two small specimens of Mexican onyx from New Capitol.

Two boulders of peculiar shape, one resembling a human foot, the other a vertebra. From Geo. House, Montgomery county, N. Y.

2. *By exchange.*

Three polished specimens, *Ammonites*, Inferior Oölite, France.

One polished specimen. *Nautilus*, Cretaceous, Alabama.

Twenty polished specimens, *Zaphrentis Halli*, Hamilton group, Skaneateles lake, N. Y.

Two polished specimens, *Heliophyllum Halli*, Hamilton group, Skaneateles lake, N. Y.

Three polished specimens, *Cystiphyllum Americanum*, Hamilton group, Skaneateles lake, N. Y.

Two polished specimens, *Amplexus*, ? Hamilton group, Skaneateles lake, N. Y.

Fourteen polished specimens, *Zaphrentis Canadensis*, Hudson River group, Cincinnati, Ohio.

Four sections on glass, *Calceola Sandalina*, Devonian, Eifel, Europe.

From the State Normal School at Cortland, N. Y., in exchange for the labor of cutting a series of specimens for the normal school.

3. *By purchase.*

Portion of tooth of fossil elephant, found near Chemung Narrows, N. Y.



## IV. ARCHÆOLOGICAL AND ETHNOLOGICAL.

*By donation.*

Indian pestle (stone), Hannacroix creek, Coeymans, N. Y.

Brick imported from Holland between 1646 and 1670, used in the gable of a building at Coeymans, known as the "Castle."

Continental paper money, "fifteen shillings." From Alfred A. Sherman, Coeymans, N. Y.

Anchor taken from the reefs at the bottom of Lake Champlain, near Plattsburg, in the summer of 1882. From J. B. Groot, Albany.

## V. TO THE LIBRARY.

1. *By donation and exchange.*

The Geological and Natural History Survey of Minnesota, Tenth Annual Report, N. H. Winchell, State Geologist.

Official Gazette, U. S. Patent Office, full series.

Department of Agriculture Special Report, Nos. 53 to 65, inclusive.

Department of Agriculture, Revision of Statutes, new series, Rept. No. 1, Oct. 1883.

Journal of the Cincinnati Society of Natural History, Vol. v, No. 4, December, 1882; Vol. VI, No. 1, April, 1883; Vol. VI No. 2, No. 3, October, 1883.

Report of Commissioners of Agriculture for 1882.

Frontiersmen of New York, two volumes, by J. R. Simms, Albany, 1882.

Bulletin of the American Geographical Society, Nos. 2 and 4, 1882; No. 1, 1883; Nos. 2 and 5, 1883.

Second Geological Survey of Pennsylvania, T. 2, Bedford and Fulton counties.

Second Geological Survey of Pennsylvania, C. 6, Philadelphia Belt.

Second Geological Survey of Pennsylvania, G. 6, Pike and Monroe counties.

Is Fingall's Cave Artificial, by F. Cope Whitehouse, M. A., December, 1882, pamphlet, 8vo.

United States Geographical Survey, Monograph ii; Tertiary History of the Grand Cañon Dist., with folio atlas of same.

Bulletin of United States Fish Commission, Vol. 1, 1881.

Journal of the American Geographical Society, Vol. 12, 1880.

Indiana Geology and Natural History, 1881; Eleventh Report of the State Geologist.

Department of the Interior, Bureau of Education, Circular of Information, Nos. 4, 5 and 6, 1882; Nos. 1 and 2, 1883; and High Schools for Girls in Sweden.

Decas plantarum novarum. Petropoli, 1882; from E. L. Regel.

Bulletin de la Société Impériale des Naturalistes de Moscou, Nos. 3 and 4, 1881, and No. 1, and No. 2, 1882, première livraison; No. 2, 1882, seconde livraison; 1881, No. 2.

Congrès Géologique International, Compte rendu 2d session, Bologne, 1881, pp. 158.

Table Générale et Systematique Matières contenues dans les premières, 56 volumes, 1829-1881.

Thèses présentées à la Faculté des Sciences de Lille, Université de France pour obtenir le grade de Docteur et sciences naturelles par Persifor Frazer, A. M., de Philadelphia, 1882.

The Pine Moth of Nantucket, by Samuel H. Scudder. Publications of the Massachusetts Society for the Promotion of Agriculture, Boston, 1883.

Sitzungsberichte und Abhandlungen der Naturwissenschaftlichen Gesellschaft. Isis in Dresden, Jahrgang, 1882, Juli bis December; Isis in Dresden, Jahrgang, 1883, Januar bis Juni.

Anales del Museo Nacional de Mexico. Tomo iii, Entrega 2, Mexico, 1883; Tomo iii, Entrega 3-a, Mexico, 1883.

Phrenological Journal, January, 1883, new series, Vol. 27, No. 1.

Answers to Inquiries about United States Bureau of Education, by Chas. Warren, M. D., 1883.

Proceedings of the Davenport Academy of Natural Sciences, Vol. III, part 3, 1879-1881.

Bulletin of American Museum of Natural History, Vol. 1, No. 4, May 1, 1883.

Annual Report (14th) American Museum of Natural History, May 1, 1883.

Smithsonian Miscellaneous Collections, 469. List of Foreign Correspondents to January, 1882; List of Foreign Correspondents, 490, volumes 22 to 27, inclusive. Additions and Corrections to List of Foreign Correspondents, to January, 1883.

Proceedings of the Canadian Institute, Toronto, Vol. 1, Fasciculus, No. 4 and 5, 1883.

Transactions of the Edinburgh Geological Society, Vol. 4, part II, October, 1882.

Catalogue of the Fossils of the Cincinnati group, by Joseph F. James, 1883.

Revision of the genus Clematis of the United States, by Joseph F. James, 1883.

Accessions to the Indian Museum, Appendix A, for quarter ending March 31, 1883. Calcutta.

Quarterly Journal, Boston Zoölogical Society; Vol. 2, No. 3, July, 1883.

Memoirs of the Boston Society of Natural History; Vol. 3, No. 7, June, 1883.

The Leading Business Men of Dakota cities, 1883.

Vögel von Borneo ün Südosten der Insel gesammelt von Hern, F. J. Grabowsky, Wien, 1883.

Dr. Platen's ornithologische sammlungen aus Amborna, Wien. 1882.

Journal of the Royal Geological Society of Ireland; Vol. XVI, pt. 2; Vol. VI, pt. 2 (new series), 1881, 1882.

Johns-Hopkins University, Baltimore, Studies from the Biological Laboratory; Vol. 2, No. 4, July, 1883.

XXIX and XXX Bericht des Vereines für Naturkunde zu Cassel, Kassel, 1883.

Annual Report of City Auditor of Boston for financial years 1882, 1883; No. 71 of series May 1, 1882, to April 30, 1883.

Report of the Commissioners of Education for 1881.

The Fossil White Ants of Colorado, by S. H. Scudder, October 10, 1883.

Transactions of Vassar Brothers Institute and its scientific section, Poughkeepsie, N. Y., 1881, 1883, Vol. 1.

Librairie ancienne de U. Hoepli Milan, Catalogue No. 17; Entomologie, etc., 1884.

Through the Smithsonian Institution :

Anales del Museo Nacional de Mexico Tomo III. Entrega 4a. (Number of Smithsonian, 16881.)

U. S. Geological and Geographical Survey of the Territories of Wyoming and Idaho, 1878, parts I and II; Hayden. (22154 and 22146.)

U. S. Geological Survey, J. W. Powell, Director.

Mineral Resources of the United States, Albert Williams, Jr., 1883. (22235).

Annual Report of the Secretary of the Interior on the Operations of the Department for the year ended June 30, 1881; Vol. III. (22171.)

No number or notice :

Second Annual Report of the United States Geological Survey to the Secretary of the Interior, 1880 and 1881. By J. W. Powell, Director.

Bulletin of the U. S. Geological Survey No. 1, Department of Interior.

United States Commission of Fish and Fisheries, Commissioners' Report, 1880.

Maps and Panoramas. Twelfth Annual Report of the U. S. Geological and Geographical Survey of the Territories, 1878.

## 2. *By purchase.*

Science, Vol. 1, Nos. 1 to 21, inclusive.

Science, Vol. 2, Nos. 22 to 45, inclusive, wanting No. 36.

American Journal of Science (wanting November number).

American Naturalist, full series.

Encyclopedia Britannica, Vols. 15-16.





## APPENDIX A.

### CATALOGUE OF TRANSLUCENT SECTIONS OF ROCKS AND FOSSILS.

LIST OF TRANSLUCENT SECTIONS OF ROCKS AND FOSSILS PREPARED  
AND MOUNTED ON GLASS, IN THE LABORATORY OF THE STATE MU-  
SEUM OF NATURAL HISTORY.

No.	Name.	Formation.	Locality.
1, 2	Cryptozoön.....		Saratoga Co., N. Y.
3, 4	Cnemidium ramulosum.....		Wurtemberg.
5	Stromatopora, Coralline limestone.....		Schoharie, N. Y.
6	Serpentine and iron.....		Westchester Co., N. Y.
7, 8	Tentaculites, Tentaculite limestone.....		Schoharie, N. Y.
9	Stromatopora, Coralline limestone.....		Schoharie, N. Y.
10, 11	Stromatopora, Hamilton group.....		Iowa City, Ia.
12	Astylospongia, Niagara group.....		Tennessee.
13	Spirifera.....		
14	Astylospongia, Niagara group.....		
15, 16	Stromatopora, Coralline limestone.....		Schoharie, N. Y.
17, 18	Astylospongia.....		Tennessee.
19	Chætetes, Trenton limestone.....		
20	Favosites with crinoid stem, Lower Helderberg.....		
21	Cnemidium ramulosum.....		Wurtemberg.
22	Stromatopora, Hamilton group.....		Iowa City.
23	Astylospongia.....		
24	Fusulina, Upper Carboniferous.....		Missouri river.
25	Cnemidium.....		Wurtemberg.
26	Astræospongia, Niagara group.....		Tennessee.
27	Astræospongia, Niagara group.....		Tennessee.
28	Favosites Niagarensis, Niagara group.....		Lockport, N. Y.
29	Favosites Forbesi, Niagara group.....		Lockport, N. Y.
30, 31	Chætetes, Shaly limestone.....		Schoharie Co., N. Y.
32	Stromatopora, Gray limestone.....		Clarksville, N. Y.
33, 34	Sponge, Trenton limestone.....		Wisconsin.
35	Favosites Forbesi, Niagara group.....		Lockport, N. Y.
36	Sponge with crinoid stem, Lower Helderberg group.		
37	Stromatopora, Guelph limestone.....		Guelph, Canada.
38	Sponge Lower Helderberg.....		
39, 40	Sponge Trenton limestone.....		
41	Sponge Lower Helderberg.....		
42	Stromatopora, Hamilton group.....		Iowa.
43	Diphyphyllum, Hamilton group.....		
44	Cnemidium ramulosum.....		Wurtemberg.
45	Sponge, Lower Helderberg.....		
46, 47	Sponge, Upper Helderberg.....		
48	Stromatopora, Hamilton group.....		Iowa.
49	Diphyphyllum, Hamilton group.....		743

No.	Name.	Formation.	Locality.
50, 51, 52	Streptelasma, Trenton limestone		
53, 54, 55	Streptelasma corniculum ? (Hall)		Cincinnati, O.
56	Chætetes, Trenton limestone		
57	Astræospongia, Niagara group		Tennessee.
58, 59	Streptelasma corniculum		Cincinnati, O.
60, 61, 62	Zaphrentis, Onondaga limestone		Schoharie, N. Y.
63	Chætetes, Trenton limestone (Geb. Coll.)		654
64, 65, 66	Columnaria, Black River limestone		
67, 68	Favosites, Hamilton group		Iowa City, Iowa.
69	Corniferous limestone		Schoharie, N. Y.
70, 71, 72	Michelinia, Hamilton group	York, Livingston Co., N. Y.	
73, 74	Heliophyllum		Old No. 376 red ?
75, 76	Stromatocerium rugosum		Old No. 701
77, 78	Heliophyllum, Hamilton group	York, Livingston Co., N. Y.	
79, 80, 81, 82	Stromatopora		Hackberry, Iowa.
83, 84	Stromatocerium		Old No. 701
85, 86	Heliophyllum		Western N. Y.
87, 88	Zaphrentis		Old No. 377
89	Zaphrentis		Schoharie, N. Y.
90, 91, 92, 93	Heliophyllum		Schoharie, N. Y.
94	Chætetes, Trenton limestone		
95, 96, 97	Zaphrentis		Iowa City.
98	Heliophyllum, Onondaga limestone		Schoharie, N. Y.
99	Heliophyllum ?		Old No. 379
100, '1, '2	No sections		
103	Phytopsis, Birdseye limestone		Watertown, N. Y.
104, 105	Phytopsis, Birdseye limestone		Fort Plain, N. Y.
106	Favosites, Coralline limestone		Schoharie, N. Y.
107	Favosites, Coralline limestone		Schoharie, N. Y.
108	Columnaria inequalis, Coralline limestone		Schoharie, N. Y.
109, 110	Phytopsis, Birdseye limestone		Fort Plain, N. Y.
111	Serpentine and calcite, Laurentian		Lewisburg, N. Y.
112	Eozoön Canadense, Laurentian		Canada.
113, 114	Spirifera mucronata (shell), Hamilton group		
115, 116	Orthis Vanuxemi (shell), Hamilton group		
117, 118	Athyris spiriferoides (shell), Hamilton group		
119, 120	Strophodonta perplana		
121	Sponge? Hudson River group		Barrytown, N. Y.
122	Phytopsis, Birdseye limestone		Fort Plain, N. Y.
123	Phytopsis, Birdseye limestone		Watertown, N. Y.
124	Phytopsis, Birdseye limestone		Fort Plain, N. Y.
125	Tentaculites, Tentaculite limestone		Cherry Valley, N. Y.
126	Lignolite, Niagara group		Lockport, N. Y.
127, '8, '9	Trematopora ponderosa, Am. Mus., 202		Clarksville, N. Y.
130, 131	Callopora ponderosa, Am. Mus., 171		Clarksville, N. Y.
132, 133	Trematopora ponderosa, Am. Mus., 184		Clarksville, N. Y.
134	Favosites, Coralline limestone		
135	Serpentine, calcite, dolomite, Laurentian		Bolton, N. Y.
136	Sponge? Hudson River group		Barrytown, N. Y.
137	Tentaculites		Cherry Valley, N. Y.
138, 139	Trematopora ponderosa, Am. Mus., 205		Catskill creek, N. Y.
140, 141	Beatricia, Hudson River group		
142	Chætetes (branching), Lower Helderberg		
143	Trematopora ponderosa, Am. Mus., 221		Clarksville, N. Y.
144	Oölite, Calciferous		Saratoga.
145	Beatricia, Hudson River group		
146	Oölite, Calciferous		Saratoga.



No.	Name.	Formation.	Locality.
147	Cornulites (Tentaculites)	Richmondensis	.....
148	Tentaculites elongatus,	Lower Helderberg.	Port Jervis, N. Y.
149	Tentaculites, Black shale	.....	Bristol Hollow.
150, '1, '2	Beatricia, Hudson River group	.....	.....
153	Tentaculites	.....	Cherry Valley, N. Y.
154, '5, '6	Beatricia, Hudson River group	.....	.....
157	Bituminous calcite vein,	Trent. lime, Flat creek,	Spraker's Basin.
158	Caudi galli grit	.....	Clarksville.
159	Tentaculites, Tentaculite	limestone	Schoharie, N. Y.
160	Sponge? Hudson River group	.....	Barrytown, N. Y.
161	Hudson River group	.....	Cincinnati, O.
162	Tentaculites, Upper	Helderberg	Delaware, O.
163	Tentaculites	.....	Ohio.
164	Tentaculites	.....	.....
165, '6, '7, '8	No sections	.....	.....
169	Hudson River group	.....	.....
170	Tentaculites	.....	.....
171	Cornulites (Tentaculites)	Richmondensis	.....
172, '3, '4	Chætetes lycoperdon,	Trenton limestone	Newport, N. Y.
175	Tentaculites spiculus	.....	.....
176	No section	.....	.....
177, 178	Foraminifera, Upper	Helderberg	.....
179	Cone in cone, Portage group	.....	Twenty-mile creek.
180	Stromatopora, with	dolomite and quartz	.....
181	No section	.....	.....
182, '3, '4, '5	Tentaculites ? styliola	.....	.....
186, 187	No sections	.....	.....
188-190 incl.	Favosites venustus,	Niagara group	.....
191	Oölitic iron ore and	Beyrichia, Clinton group,	Wolcott, Wayne Co., N. Y.
192	Oölitic iron ore, Beyrichia and	Bryozoans, Clinton group,	Wolcott, Wayne Co., N. Y.
	No sections.	.....	.....
200, '1, '2	Cyathophyllum, Hamilton group	.....	Alden, N. Y.
203, 204	.....	.....	Livingston Co., N. Y.
205, 206	Heliophyllum	.....	Darien, N. Y.
207	Favistella stellata,	Hudson River group	Cincinnati, O.
208	Stromatopora (broken and destroyed)	.....	Hackberry, Iowa.
209, '10, '11	Stromatopora	.....	Hackberry, Iowa.
212	Stromatopora	.....	Schoharie.
213	Stromatopora	.....	.....
214	Stromatopora, Lockport ?	(Pickett Coll.)	.....
215	Heliophyllum	.....	Darien, N. Y.
216	Stromatopora	.....	Hackberry, Iowa.
217	Stromatopora	.....	Hackberry, Iowa.
218, '19, '20, '21	Stromatopora	.....	Hackberry, Iowa.
222, 223	Stromatopora, Lower	Pentamerus	New Scotland, N. Y.
224-31 incl.	Cryptozoön	.....	3 m. W. Saratoga, N. Y.
232-35 incl.	Zaphrentis, Coralline	limestone	Clarksville, N. Y.
236, 237	Zaphrentis, Corniferous	.....	Schoharie, N. Y.
238, 239	Cystiphyllum	.....	Western New York.
240, 241	Zaphrentis	.....	Schoharie, N. Y.
242, '3, '4, '5	Eridophyllum, Upper	Helderberg group	.....
246	Favistella, Hudson River group	.....	.....
247-50 incl.	Chætetes, Hudson River group	.....	Cincinnati, O.
251-4 incl.	Eridophyllum	.....	Schoharie.

No.	Name.	Formation.	Locality.
255	Stromatopora.....		Lockport or Rochester.
256-61 incl.	Stromatopora.....		Hackberry, Iowa.
262-66 incl.	Chaetetes .....		Canada.
267	Zaphrentis.....		Schoharie, N. Y.
268-71 incl.	Acervularia rugosa. ....		Albany Co., N. Y.
272, 273	Favosites Emmons. ....		Albany Co., N. Y.
274, '5, '6	Stromatopora.....		Iowa.
277, 278	Stromatopora.....		Iowa.
279-84 incl.	Chaetetes, Trenton limestone. ....		
285, '6, '7	Oolite.....		Schoharie, N. Y.
288, 289	Heliophyllum, Corniferous limestone. ....		Clarksville, N. Y.
290-93 incl.	Stromatopora, Upper Helderberg (Pickett Coll.)		
294, 295	Chaetetes, Trenton limestone .....		Middleville, N. Y.
297-300 incl.	Stromatopora, Niagara group.....		Skanandoa.
301, '2, '3	Heliophyllum Halli.....		York, Livingston Co., N. Y.
304, '5, '6	Stromatopora.....		Schoharie.
307, 308	Zaphrentis.....		Skaneateles lake, N. Y.
308, '9, '10, '11	Stromatopora .....		Schoharie.
312, 313	Cystiphyllum.....		Western New York.
314, '15, '16	Chaetetes .....		Cincinnati.
317, '18, '19	Favosites Helderbergiae .....		Schoharie, N. Y.
320, '1, '2, '3	Stromatopora.....		Schoharie, N. Y.
324, '5, '6	Favosites Emmons. ....		Cherry Valley, N. Y.
327, 328	Zaphrentis.....		Skaneateles lake, N. Y.
330, '1, '2, '3	Favosites.....		Schoharie, N. Y.
334, '5, '6	Favosites Emmons. ....		Schoharie, N. Y.
337, '8, '9	Diphyphyllum, Niagara group.....		Lockport, N. Y.
340, '1, '2, '3	Favosites .....		Cherry Valley.
344, '5, '6, '7	Zaphrentis. ....		Cherry Valley.
348, '9, '50	Favosites.....		Clarke Co., Ind.
351, '2, '3	Favosites.....		Schoharie, N. Y.
354, '5, '6, '7	Monticulopora fibrosa, Hudson River group ...		Cincinnati, O.
358, '9, '60	Monticulopora dali, Hudson River group.....		Cincinnati, O.
361, 362	Monticulopora mammulata, Hudson River group.....		Cincinnati, O.
363, 364	Stellipora antheloidea, Hudson River group.....		Cincinnati, O.
365, '6, '7, '8	Monticulopora sp. ? Hudson River group.....		Cincinnati, O.
369, 370	Acervularia.....		Iowa.
371-75 incl.	Acervularia.....		Port Jervis, N. Y.
376, 377	Favosites.....		Port Jervis, N. Y.
378-82 incl.	Zaphrentis.....		Horn Rock, Skaneateles lake.
383-87 incl.	Zaphrentis.....		Delphi, N. Y.
388, 389	Cystiphyllum.....		Skaneateles lake.
390, 391	Zaphrentis.....		Skaneateles lake.
392, 393	Heliophyllum.....		Skaneateles lake.
394, '5, '6	Favosites.....		Cobleskill, N. Y.
397-401 incl.	Heliophyllum, Hamilton group.....		West Williams, Canada.
402-11 incl.	Cystiphyllum, Hamilton group.....		West Williams, Canada.
412, 413	Monticulopora ponderosa, Hudson River group.....		Cincinnati, O.
414, '15, '16	Dekayia attrita, Hudson River group.....		Cincinnati, O.
417, 418	Favosites.....		Port Jervis, N. Y.
419-22 incl.	Stromatopora.....		Port Jervis, N. Y.
423	Astylospongia inornata, Lower Helderberg ...		Schoharie, N. Y.
424, 425	Favosites minimus, Lower Helderberg .....		Schoharie, N. Y.
426-37	Tentaculites.....		Cherry Valley.
438, '9, '40	Zaphrentis Halli.....		Skaneateles lake.
441, '2, '8	Stromatopora.....		Schoharie, N. Y.
444, '5, '6	Halysites catenulata.....		Port Jervis, N. Y.

No.	Name.	Formation.	Locality.
447, '8, '9	Stromatopora granulifera,	Corn. limestone.	Kelly's island.
450, '1, '2, '3	Stromatopora granulifera,	Corn. limestone.	Falls of the Ohio.
454-58 incl.	Astylospongia inornata.		Schoharie, N. Y.
459, 460	Diphyphyllum and Chætetes.		Port Jervis, N. Y.
461-66 incl.	Favosites Niagarensis.		Port Jervis, N. Y.
467, '8, '9	Zaphrentis Halli, Hamilton group.		York, Liv. Co., N. Y.
470, 471	Favosites venustus, Niagara group.		Lockport, N. Y.
472, 473	Chætetes, Lower Helderberg		
474, 475	Cænostroma incrustans.		Rockford, Iowa.
476, 477	Stromatopora expansa.		Rockford, Iowa.
478, 479	Favosites incrustated with Stromatopora.		Schoharie, N. Y.
480, '1, '2	Favosites Helderbergiæ.		Schoharie, N. Y.
483, 484	Favosites		Schoharie, N. Y.
485, 486	Caunopora planulata.		Rockford.
487, 488	Houghtonia Huronica, Hudson River group.		Drummond's Isl.
489, '90, '91	Eozoön Canadense		Canada.
492	Chætetes fibrosa, Trenton limestone.		Trenton Falls, N. Y.
493	Streptelasma corniculum, Hudson River group.		Cincinnati, O.
494, 495	Favosites Emmons.		Western New York.
496, '7, '8	Acervularia Davidsoni.		Iowa City.
499, 500	Stromatopora		Schoharie.
501, '2, '3, '4	Favosites		Iowa City.
505, 506	Chætetes, Corniferous lime		Lexington, Ind.
507, 508	Favosites, Coralline limestone.		Schoharie, N. Y.
509-514 incl.	Niagara limestone.		Lockport, N. Y.
515-518 incl.	Heliophyllum		Darien, N. Y.
519, 520	Michelinia stylopore.		Darien, N. Y.
521-526 incl.	Chætetes, Lower Helderberg.		Schoharie.
527-530 incl.	Heliophyllum.		Canada.
531-534 incl.	Sponge, Hudson River group.		Turner Station, Ky.
535, '6, '7	Stromatopora		Town of Malden, Canada.
538-547 incl.	Astylospongia meniscus		Tennessee.
548-564 incl.	Cryptozoön.		Greenfield, Saratoga Co.
565, '6, '7	Michelinia.		Clarksville.
568, '9, '70	Michelinia.		Cherry Valley.
571, 572	Stromatopora.		Sharon Hill.
573, 574	Michelinia		Cherry Valley.
575, 576	Heliophyllum, Hamilton group.		Darien, N. Y.
577-587 incl.	Favosites		Waldron, Ind.
588-600 incl.	Zaphrentis		Waynesville, O.
601-606 incl.	Heliophyllum		Little Traverse bay, L. Michigan.
607-610 incl.	Favosites.		Waldron, Ind.
611-615 incl.	Chonophyllum magnificum		Falls of Ohio.
616	No section.		
617	Favosites, Hamilton group.		Near Castleton, Ontario Co., N. Y.
618	Cystiphyllum.		West Williams, Canada.
619	Heliophyllum, Hamilton group		York, Liv. Co., N. Y.
620, '1, '2			Alden, Erie Co., N. Y.
623-642 incl.	Zaphrentis, Hudson River group.		Waynesville, O.
640-650 incl.	Stromatopora		Kelly's island.
651, '2, '3	Stromatopora		Kelly's island.
654, '5, '6, '7	Stromatopora, Lower Helderberg		Delphi, N. Y.
658, '59, '60	Stromatopora minuta, Niagara group.		Pt. Detour, L. Michig'n.
661, '2, '3, '4, '5	Stromatopora (Syringostroma) sp.?		Hamilton group, W. N. Y.
666, '67, '68	Stromatopora var. foliculatum, Lr. Heldbg.		Clarksville, N. Y.
669-673 incl.	Stromatopora.		White's quarries, Malden, Canada.
674-681 incl.	Stromatopora		Loc.?



No.	Name.	Formation.	Locality.
682-689 incl.	Stromatopora.....		Iowa City, Iowa.
690-698 incl.	Stromatopora.....		Loc.?
699-701 incl.	Zaphrentis and Stromatopora.....		Loc.?
702-708 incl.	Stromatopora.....		Herkimer Co.
709-714 incl.	Stromatopora, Upper Pentamerus.....		Cumberland, Md.
715, 716	Same overgrowing Favosites.....		Cumberland, Md.
717-720 incl.	Stromatopora.....		Loc.?
721	Stromatopora, Coralline lime.....		Schoharie, N. Y.
722-725 incl.	Stromatopora.....		Loc.?
726-729 incl.	Stromatopora minuta, Niagara group.....		Louisville, Ky.
730-733 incl.	Cryozoon.....		Saratoga Co., N. Y.
734-738 incl.	Stromatopora.....		Clarksville, N. Y.
739-742 incl.	Stromatopora.....		Kelly's island.
743-754 incl.	Stromatopora, Lower Pentamerus.....		Clarksville, N. Y.
755-761 incl.	Stromatopora.....		Little Traverse bay, L. Michigan.
762-766 incl.	Stromatopora.....		Sharon Hill, N. Y.
767-775 incl.	Stromatopora.....		Kelly's island.
776-779 incl.	Astylospongia bursa.....		Waldron, Ind.
780-788 incl.	Phytopsis, Birdseye limestone.....		Canajoharie, N. Y.
789-793 incl.	Cyathophyllum rugosum.....		Loc.?
794-798 incl.	Favosites.....		Cumberland, Md.
799-809 incl.	Columnaria.....		Schoharie, N. Y.
810-814 incl.	Niagara limestone.....		Lockport, N. Y.
815-825 incl.	Columnaria.....		Schoharie, N. Y.
826-831 incl.	Favosites, Coralline limestone.....		Schoharie, N. Y.
832-842 incl.	Columnaria.....		Schoharie, N. Y.
843	Columnaria.....		Loc.?
844-849 incl.	Columnaria, Coralline limestone.....		Schoharie, N. Y.
850-862 incl.	Stromatopora, Coralline limestone.....		Schoharie, N. Y.
863-876 incl.	Heliophyllum sp.?	r. r. t., 299, Canada West.	
878, '79, '80	Favosites, Chætetes and Alveolites, Lower Pentamerus		
881-893 incl.	Favosites, etc., Genesee slate—Limestone band, Iron bridge near Alden.....		
894-897 incl.	Stromatopora, Coralline limestone.....		Port Jervis.
898-902 incl.	Stromatopora.....		Crawfordsville, Ind.
903, '4, '5	Favosites.....		Thompson's lake.
906-914 incl.	Columnaria alveolata, Black River.....		
915, '16, '17	Favosites Forbesi, Niagara group.....		Waldron, Ind.
918-921 incl.	Alveolites, Hamilton group.....		Canada West.
922-929 incl.	Stromatopora constellata, Coralline lime.....		Schoharie, N. Y.
930, '31	Cyathophyllum rugosum, Corniferous.....		Falkirk, N. Y.
932, '3, '4, '5	Cyathophyllum rugosum, Corniferous.....		Clarksville, N. Y.
936, '7, '8	Favosites Forbesi, Niagara group.....		Waldron, Ind.
939-943 incl.	Fossil Wood, Tertiary.....		Virginia.
944-951 incl.	Favosites Forbesi.....		Waldron, Ind.
952-959 incl.	Favosites venustus.....		Iowa.
960-966 incl.	Trenton limestone.....		Saratoga.
967-973 incl.	Diphyphyllum, Niagara group.....		
974-978 incl.	Oolite.....		Iowa.
979-986 incl.	Astylospongia, Niagara group.....		Waldron, Ind.
987-992 incl.	Stromatocentrum rugosum, Black River.....		
993, '4, '5	Zaphrentis.....		Clarksville.
996-1000 incl.	Lower Helderberg.....		Port Jervis.
1001, '2, '3	Stromatopora, Upper Helderberg.....		Williamsville, N. Y.
1004, 1005	Favosites, Upper Helderberg.....		Canada.
1006, 1007	Zaphrentis.....		Waynesville, O.
1008-1012 incl.	Zaphrentis, Hudson River group.....		Waynesville, O.

No.	Name.	Formation.	Locality.
1013, '14, '15	Syringostoma,	Corniferous limestone.....	Leroy, N. Y.
1016-1062 incl.	Heliophyllum Halli,	Hamilton group.....	Leroy, N. Y.
1063-1072 incl.	Zaphrentis Canadensis,	Hudson River group..	Waynesville, O.
1073-1078 incl.	Chaetetes lycoperdon.....		Middleville, N. Y.
1079-1095 incl.	Heliophyllum Halli,	Hamilton group.....	Leroy, N. Y.
1096-1099 incl.	Heliophyllum sp. ?	Hamilton group.....	Leroy, N. Y.
1100-1114 incl.	Heliophyllum sp. ?	Hamilton group.....	Leroy, N. Y.
1115, 1116	Heliophyllum Halli,	Hamilton group.....	Leroy, N. Y.
1117	Heliophyllum sp. ?	Hamilton group.....	Leroy, N. Y.
1118	Heliophyllum Halli,	Hamilton group.....	Leroy, N. Y.
1119	Trenton limestone.....		Saratoga.
1120-1125 incl.	Zaphrentis Canadensis,	Hudson River group..	Waynesville, O.
1126-1137 incl.	Beatricia huronica.....		Jefferson, Ky.
1138-1146 incl.	Tetradium.....		
1147, 1148, '49	Heliophyllum,	Upper Helderberg.....	Clarksville.
1150-1154 incl.	Heliophyllum,	Upper Helderberg.....	Cherry Valley.
1155	Zaphrentis.....		Clarksville.
1156, 1157	Cystiphyllum,	Hamilton group.....	York, N. Y.
1158-1163 incl.	Zaphrentis Canadensis,	Hudson River group..	Waynesville, O.
1164, '5, '6	Heliophyllum and Favosites,	Ham. group.....	E. Bethany, N. Y.
1167	Heliophyllum Halli,	Hamilton group.....	E. Bethany, N. Y.
1168-1175 incl.	Zaphrentis Canadensis,	Hudson River group..	Waynesville, O.
1176	Heliophyllum Halli.....		Canada West.
1177-1180 incl.	Heliophyllum sp. ?.....		Near Avon, N. Y.
1181	Cystiphyllum,	Hamilton group.....	Canada.
1182	Cystiphyllum,	Hamilton group.....	Canada.
1183, 1184	Heliophyllum Halli.....		E. Bethany, N. Y.
1185, 1186	Cystiphyllum,	Hamilton group.....	West Williams, Canada.
1187, 1188	Cystiphyllum,	Hamilton group.....	Skaneateles lake.
1189, 1190	Heliophyllum.....		Skaneateles lake.
1191, 1192	Zaphrentis.....		Skaneateles lake.
1193-1197 incl.	Heliophyllum.....		E. Bethany, N. Y.
1198-1200 incl.	Zaphrentis,	Upper Helderberg.....	Cherry Valley.
1201, 1202	Cystiphyllum Americanum,	Hamilton group.....	Moscow, N. Y.
1203-1207 incl.	Heliophyllum sp. ?.....		Darien, N. Y.
1208-1212 incl.	Zaphrentis Canadensis,	Hudson River group..	Richmond, Ind.
1213, 1214	Heliophyllum,	Hamilton group.....	West Williams, Canada.
1215-1230 incl.	Zaphrentis Canadensis.....		Waynesville, O.
1231-1237 incl.	Heliophyllum sp. ?	Hamilton group.....	Bosanquet, Canada.
1238, '39, '40	Heliophyllum,	Hamilton group.....	Little Traverse bay, L. Mich.
1241, '42, '43	Heliophyllum sp. ?	Hamilton group.....	Little Traverse bay, L. Mich.
1244-1252 incl.	Zaphrentis Canadensis.....		Richmond, Ind.
1253, '4, '5, '6	Heliophyllum,	Hamilton group.....	York, N. Y.
1257-1261 incl.	Clisiophyllum.....		Clarksville, N. Y.
1262-1275 incl.	Heliophyllum,	Hamilton group.....	Darien, N. Y.
1276-1280 incl.	Heliophyllum,	Hamilton group.....	Near Leroy, N. Y.
1281-1289 incl.	Heliophyllum Halli,	Hamilton group.....	Near Leroy, N. Y.
1290	Zaphrentis,	Upper Helderberg.....	
1291, '2, '3	Marble.....		Hampton point. ?
1294-98 incl.	Fragments of shells,	Clinton group.....	
1299	Campophyllum,	Hamilton group.....	Iowa City.
1300	Cystiphyllum Americanum,	Hamilton group.....	W. New York.
1301	Stromatopora?	Upper Helderberg.....	Kelly's island.
1302-8 incl.	Foraminifera,	Upper Helderberg.....	Kelly's island.
1309-37 incl.	Acervularia,	Upper Helderberg.....	Kelly's island.
1338-42 incl.	Diphyphyllum,	Upper Helderberg.....	Kelly's island.
1343-48 incl.	Acervularia,	Hamilton group.....	Little Traverse bay, L. Mich.

No.	Name.	Formation.	Locality.
1349, '50	Favosites, Corniferous limestone.....		Falkirk, N. Y.
1351-56 incl.	Niagara limestone.....		Lockport, N. Y.
1357, '8, '9	Eridophyllum, Corniferous limestone.....		Clarksville, N. Y.
1360-64 incl.	Favosites Emmonsii, Corniferous limestone.....		Clarksville, N. Y.
1365, '6, '7	Favosites hemispherica.....		Clarksville, N. Y.
1368, '69, '70	Chaetetes, Upper Helderberg.....		Kelly's island, O.
1371, '2, '3, '4	Astylospongia inornata, Lower Helderberg.....		Clarksville, N. Y.
1375-79 incl.	Syringopora, Upper Helderberg.....		Kelly's island, O.
1380, '81	Astylospongia præmorsa.....		Waldron, Ind.
1382-87 incl.	Syringopora, Upper Helderberg.....		Cherry Valley, N. Y.
1388, '89, '90	Stromatopora, Coralline limestone.....		Schoharie, N. Y.
1391, '92	Stromatopora constellata, Coralline limestone.....		Schoharie, N. Y.
1393-1411 incl.	Columnaria alveolata, Black River lime.....		Lake Champlain.
1412-17 incl.	Acervularia, Corniferous lime.....		Clark Co., Ind.
1418, '19	Tentaculite limestone.....		Schoharie, N. Y.
1420-28 incl.	Stromatocerium rugosum, Black River lime.....		Lake Champlain.
1429-33 incl.	Stromatocerium with Columnaria alveolata.....		Lake Champlain.
1434, '35, '36			
to '40	Favosites Niagarensis.....		Schoharie.
1441	Favosites venustus.....		Schoharie.
1442-51 incl.	Columnaria inequalis, Coralline limestone.....		Schoharie.
1452, '3, '4	Halysites catenulatus, Coralline limestone.....		Schoharie.
1455-60 incl.	Halysites catenulatus, Coralline limestone.....		Schoharie.
1461, '2, '3, '4	Heliophyllum, Upper Helderberg.....		Clarksville.
1465, '66	Tetradium, Hudson River group.....		Shore Lake Ontario.
1467-74 incl.	Tetradium, Trenton group.....		Albany, Ga.
1475-79 incl.	Favosites Emmonsii, Upper Helderberg.....		Clarksville, N. Y.
1480-84 incl.	Favosites hemisphericus, Upper Helderberg.....		Clarksville, N. Y.
1485-88 incl.	Calcite.....		Mammoth cave, Ky.
1489, '90, '91	Niagara limestone.....		Lockport, N. Y.
1492, '93	Encrinal limestone.....		
1494-1501 incl.	Chaetetes lycoperdon, Trenton limestone.....		New York.
1502, '3, '4, '5, '6	Chaetetes lycoperdon, Trenton limestone.....		Trenton Falls.
1507, '8	Chaetetes lycoperdon (loose specimen).....		Helderberg mts.
1509-13 incl.	Chaetetes, Hudson River group (Pickett Coll.).		
1514	Heliophyllum, Upper Helderberg.....		Falkirk, N. Y.
1515-20 incl.	Recent coral.....		
1521, '2, '3, '4	Chaetetes lycoperdon, Trenton lime.....		Middleville, N. Y.
1525, '6, '7 to '30	Cryptozoön, Calciferous (loose).....		Schoharie, N. Y.
1531, '2, '3	Chaetetes, Corniferous lime.....		Kelly's island.
1534-41 incl.	Niagara limestone.....		Lockport, N. Y.
1542-46 incl.	Zaphrentis Canadensis, Hudson River group.....		Drummond's Isl.
1547-55 incl.	Cyathophyllum rugosum, Upper Helderberg.....		Thompson's lake.
1556-72 incl.	Favosites venustus, Niagara group.....		
1573-77 incl.	Monticulipora, Hudson River group.....		Waynesville, Ohio.
1578-82 incl.	Astylospongia inornata, Lower Helderberg.....		Schoharie, N. Y.
1583-87 incl.	Tetradium, Birdseye limestone.....		Little Falls, N. Y.
1588-99 incl.	Upper Helderberg limestone.....		Clarksville, N. Y.
1600-5 incl.	Tentaculite limestone.....		Indian Ladder, N. Y.
1606-11 incl.	Acervularia, Hamilton group.....		West Williams, Canada.
1612-15 incl.	Astylospongia inornata, Lower Helderberg.....		Clarksville, N. Y.
1616, '17, '18	Michelinia.....		
1619, '20, '21	Corniferous limestone.....		Leroy, N. Y.
1622-32 incl.	Acervularia, Corniferous lime.....		Kelly's island.
1633, '34	Chaetetes.....		Kelly's island.
1635-53 incl.	Tetradium, Trenton limestone.....		
1654-68 incl.	Corniferous limestone.....		Clarksville, N. Y.
1669-73 incl.	Cyathophyllum rugosum, Upper Helderberg.....		Clarksville, N. Y.



No.	Name.	Formation.	Locality.
1674-78 incl.	Acervularia, Upper Helderberg.....		Kelly's island, O.
1679, 80	Favosites Emmonsii and Stromatopora, Cornif. lime.		Charleston, Ind.
1681-89 incl.	Upper Helderberg.....		Charleston, Ind.
1690-94 incl.	Monticulopora, Hudson River group.....		Waynesville, Ohio.
1695-1707 incl.	Niagara limestone.....		Lockport, N. Y.
1708, '9, '10, '11	Michelinia, Upper Helderberg.....		Leroy, N. Y.
1712	Cyathophyllum rugosum, Upper Helderberg.....		Clarksville.
1713-29 incl.	Stromatopora, Upper Helderberg.....		Kelly's island, O.
1730, '31	Favosites hemispherica, Upper Helderberg..		Cedarville, N. Y.
1732-38 incl.	Stromatopora, Lower Pentamerus.....		Cedarville, N. Y.
1739	Favosites Helderbergiae, Stromatopora and Alveolites,		Cedarville, Herkimer Co., N. Y.
1740-72 incl.	Stromatopora, Lower Pentamerus.		Cedarville, Herkimer Co., N. Y.
1773	Callopora, Hamilton group.....		Eighteen-mile creek, N. Y.
1774	Eridophyllum, Corniferous limestone.....		Cedarville, N. Y.
1775-78 incl.	Pachyphyllum Woodmani, Chemung group..		Hackberry, Iowa.
1779, '80	Hamilton group.....		Independence, Iowa.
1781	Eozoön Canadense.....		Thurman, N. Y.
1782, '3, '4	Ophiolyte.....		Lowell, Mass.
1785-89 incl.	Cyathophyllum rugosum, Upper Held.....		Clarksville, N. Y.
1790-96 incl.	Stromatopora, Upper Helderberg.....		Kelly's island, Ohio.
1797-1803 incl.	Stromatopora, Upper Helderberg.....		Kelly's island, Ohio.
1804-13 incl.	Stromatopora, Hamilton group.....		Skaneateles lake, N. Y.
1814-17 incl.	Stromatocerium rugosum, Black River group..		Lake Champlain.
1818, '19, '20	Stromatopora.....		
1821-30 incl.	Concretion ? Hudson River group .....		Stuyvesant, N. Y.
1831, '2, '3	Favosites, Upper Helderberg.....		Clarksville, N. Y.
1837-40 incl.	Cryptozoön, Calciferous group.....		Little Falls, N. Y.
1841, '2, '3	Favosites, Hamilton group.....		New York.
1844, '5, '6	Alveolites, Hamilton group.....		Little Traverse bay, L. Mich.
1844, '5, '6, '7	Cryptozoön Calciferous group .....		Little Falls, N. Y.
1848	Astræospongia meniscus, Niagara group .....		Tennessee.
1849-52 incl.	Stromatopora, Coralline limestone.....		Schoharie, N. Y.
1853	Favosites, Hamilton group .....		Alden, N. Y.
1854, 1855	Stalagmite (cave).....		Thompson's lake, N. Y.
1856-60 incl.	Tennessee marble.....		(New Capitol).
1861	"Mexican onyx".....		(New Capitol).
1862-66 incl.	Niagara limestone .....		Lockport, N. Y.
1867	Tetradium, Hudson River group.....		
1868	Sponge, Hudson River group.....		Kentucky.
1869, 1870	Belemnite .....		
1871, '2, '3, '4	Stalactite .....		Ball's cave, N. Y.
1875, '6, '7	Cyathophyllum rugosum, Upper Held.....		Clarksville, N. Y.
1878	Zaphrentis, Hamilton group.....		Skaneateles lake.
1879	Heliophyllum, Hamilton group .....		Darien, N. Y.
1880	Astylospongia inornata, Lower Helderberg..		Clarksville, N. Y.
1871, 1882	Chætetes lycoperdon.....		Middleville, N. Y.
1883-88 incl.	Niagara limestone.....		Lockport, N. Y.
1889	Favosites Niagarensis, Coralline limestone..		Schoharie, N. Y.
1890	Favosites Forbesi, Niagara group.....		Waldron, Ind.
1891	Astylospongia præmorsa, Niagara group.....		Waldron, Ind.
1892	Columnaria inequalis, Coralline lime .....		Schoharie, N. Y.
1893, 1894	Hornstone, Upper Helderberg.....		
1895, 1896	Eridophyllum, Upper Helderberg.....		
1897, 1898	Shell limestone, Hudson River group.....		
1899	Stromatopora.....		Louisville, Ky.

No.	Name.	Formation.	Locality.
1900	Stromatopora.....		Sharon, N. Y.
1901, '2, '3, '4	Fossil wood .....		
1905	Oölite .....		
1906	Favosites.....		
1907	Diphyphyllum, Corniferous limestone.....		
1908	.....		
1909, 1910	Stromatopora.....		Kelly's island.
1911, 1912	Stromatopora expansa, Chemung.....		Rockford, Iowa.
1913, '14, '15	Stromatopora, Coralline limestone.....		Schoharie, N. Y.
1916	Callopora ponderosa, Lower Helderberg.....		Schoharie, N. Y.
1917	Astylospongia inornata, Lower Helderberg.....		Clarksville, N. Y.
1918	Cænostroma incrustans, Chemung.....		Rockford, Iowa.
1919, '20, '21	Favosites and Heliophyllum, Hamilton group.....		West Williams, Ca.
1922, '23	Favosites, Hamilton group .....		West Williams, Ca.
1924-28 incl.	Strombodes pentagona, Niagara group .....		Louisville, Ky.
1929-32 incl.	Chætetes, Upper Coal Measures .....		Jackson Co., Mo.
1933-37 incl.	Stromatocerium, Hudson River group (drift).....		Michigan.
1938-41 incl.	Fusulina, Carboniferous .....		Upper Missouri.
1941-45 incl.	Michelinia, Corniferous.....		Cherry Valley.
1946-47 incl.	Michelinia, Upper Helderberg.....		Clarksville, N. Y.
1948-52 incl.	Michelinia Stylopora, Hamilton group.....		
1953, 1954	Tetradium, Hudson River .....		
1955-58 incl.	Stromatopora .....		Bohemia.
1959	Sponge, Hudson River group.....		Kentucky.
1960-64 incl.	Astræospongia meniscus, Niagara group .....		Tennessee.
1965, 1966	Niagara limestone .....		Lockport.
1967-73 incl.	Favosites Niagarensis, Coralline lime.....		Schoharie, N. Y.
1974	Favosites Niagarensis, Chætetes and Stromatopora, Coralline limestone .....		Schoharie, N. Y.
1975, 1976	Halysites catenulatus, Niagara group.....		Port Jervis, N. Y.
1977, 1978	Stromatopora.....		Sharon Hill, N. Y.
1979	Favosites .....		
1980	Oölite, Calciferous.....		Saratoga Co., N. Y.
1981	Favosites Forbesi, Niagara.....		Waldron, Ind.
1982	Astylospongia inornata, Lower Helderberg.....		New York.
1983	Clinton iron ore.....		
1984-88 incl.	Monticulipora, Hudson River group.....		Cincinnati, O.
1989-91 incl.	Monticulipora fibrosa, Hudson River group....		Cincinnati, O.
1992, '93	Monticulipora dalii, Hudson River group.....		Cincinnati, O.
1994	Monticulipora mammulata, Hudson River group, Cincinnati, O.		
1995, '96	Stellipora antheloidia, Hudson River group.....		Cincinnati, O.
1997	Chætetes .....		
1998	Stromatopora ? .....		Port Jervis.
1999, 2000	Eozoön Canadense, Laurentian... Thurman, Warren Co., N. Y.		
2001-5 incl.	Ophiolite.....		Massachusetts.
2006, '7	Oölite, Calciferous group.....		Saratoga, N. Y.
2008-11 incl.	Alveolites, Chemung group.....		Rockford, Ia.
2012	Cænostroma incrustans and Alveolites .....		Rockford, Ia.
2013, '14	Favosites Emmonsii, Upper Helderberg group..		Clarke Co., Ind.
2015, '16	Favosites.....		Iowa.
2017-19 incl.	Acervularia Davidsoni, Hamilton group .....		Iowa City.
2020, 21	Favosites Niagarensis, Coralline limestone.....		Schoharie.
2022	Trenton limestone.....		Flat creek, Montgomery Co., N. Y.
2023	Waterline group (limestone).....		
2024	Onondaga salt group (limestone).....		
2025	Medina sandstone.....		
2026	Astræospongia meniscus, Niagara group.....		Tennessee.
2027, '28	Diphyphyllum.....		

No.	Name.	Formation.	Locality.
2029, '30, '31	Zaphrentis, Upper Helderberg group...		Clarksville, N. Y.
2032-42 incl.	Favosites Forbesi, Niagara group.....		Waldron, Ind.
2043, '4, '5	Crinoid stem.....		
2046-51 incl.	Stromatopora, Lower Pentamerus.....		Clarksville, N. Y.
2052, '3, '4	Favosites Niagarensis, Coralline limestone...		Schoharie, N. Y.
2055	Diphyphyllum and Stromatopora, Corall. lime.		Port Jervis, N. Y.
2056 '7	Stromatopora, Coralline limestone.....		Schoharie, N. Y.
2058-64 incl.	Upper Helderberg limestone.		Clarksville, N. Y.
2065-70 incl.	Favosites, Upper Helderberg limestone..		Cherry Valley, N. Y.
2071	Monticulipora, Hudson River group.....		Cincinnati, O.
2072	Chaetetes lycoperdon, Trenton limestone.....		New York.
2073, '74	Chaetetes, Corniferous limestone.....		Lexington, Ind.
2075	Lower Helderberg limestone.....		Hudson, N. Y.
2076, '77	Alveolites, Hamilton group.....		W. Williams, Canada.
2078, '79	Diphyphyllum, Upper Helderberg group.....		
2080	Cystiphyllum, Hamilton group.....		W. New York.
2081-87 incl.	Stromatopora, Upper Helderberg group...		Kelly's island, O.
2088	Favosites venustus, Niagara group..		Lockport, N. Y.
2089	Chaetetes, Stromatopora, Favosites Niagarensis, Coralline limestone.....		Schoharie, N. Y.
2090, '91	Columnaria, Hudson River group (Western)....		
2092	Cryptozoön, Calciferous group.....		Saratoga Co., N. Y.
2093	Medina sandstone.....		
2094	Beyrichia, Clinton group.....		
2095, '6, '7	Stromatopora expansa, Chemung group.....		Rockford, Iowa.
2098-2100 incl.	Stromatopora .....		Iowa.
2101, 2102	Favosites, Hamilton group.....		Iowa City, Iowa.
2103-2107 incl.	Favosites, Hamilton group. ....		Iowa City, Iowa.
2109, '10, '11	Chaetetes, Upper Coal Measure.....		Newburgh, Ind.
2112-15 incl.	Halysites, Niagara group.....		Iowa.
2116, '17, '18	Beatricia, Hudson River group.....		Waynesville, O.
2119, '20, '21	Stromatopora, Hamilton group.....		York, N. Y.
2122-27 incl.	Stromatopora and Heliophyllum.....		York, N. Y.
2128	Chaetetes, Trenton limestone (Geb. Coll.).		

[To this list there are to be added several hundred specimens not yet recorded.]





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REPORT

OF THE

STATE ENTOMOLOGIST

TO THE

REGENTS OF THE UNIVERSITY OF THE STATE OF NEW YORK.

For the Year 1883.

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# REPORT.

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*To the Honorable Board of Regents of the University of the State of New York\*:*

GENTLEMEN — Under the provisions of Chapter 377 of the Laws of 1881, providing for the office of State Entomologist, it was required that "the Entomologist shall render an annual report of his labors and investigations to the Legislature."

Under Chapter 355 of the Laws of 1883, regulating the State Museum of Natural History, it is provided that the State Entomologist shall become, by appointment of the trustees of said Museum, a member of its scientific staff; and that his scientific contributions be hereafter published by the Museum, in lieu of the report to the Legislature formerly required by law.

In reply to a communication from your Secretary in May last, inquiring if the appointment above provided for was desired by me, I returned answer as follows:

DAVID MURRAY, LL. D., *Secretary of Board of Regents:*

DEAR SIR — To your kind favor of the 23d inst., I beg leave to reply:

My appointment by the Board of Regents of the University as a member of the scientific staff of the State Museum of Natural History, under the provisions of Chapter 355 of the Laws of 1883, would be entirely agreeable to me, and is desired.

It will give me pleasure to coöperate in earnest effort to extend the usefulness of the State Museum with which I have been so long and pleasantly connected; and also, to prosecute my studies and labors in future, under the guidance and direction of your honorable board, in accordance with my original desire, at the establishment of my present office.

Very truly yours,

J. A. LINTNER.

ALBANY, May 26, 1883.

Under date of June 1, 1883, your Secretary honored me with official notification of my appointment by your board as State Entomologist.

Since that time I have continued to pursue my studies and investigations in the office that had been provided for me in the Capitol.

I beg leave to present the following as a brief synopsis of my subsequent operations:

A long delay in the publication of my first report to the Legislature,\* and the length of time that it remained in my hands before its final issue in November last, delayed any advance work. This, with the other duties of my office, have prevented me from having in readiness the annual report embodying my scientific investigations of the past year, which I would have been happy to present to your honorable board at this time. You will, therefore, I trust, excuse its delay which has seemed inevitable, and accept at the present a brief statement of my official labors since the date of my appointment.

### CORRESPONDENCE AND EXAMINATIONS.

The correspondence of the office has been large, and, unaided as I am, somewhat burdensome. With the increasing interest felt throughout our country in the causes and means of control of insect injuries, calls for information upon these and kindred points are increasing in frequency. While so few of our States have their entomologists, additional labor devolves upon the few individuals who have been specially set apart for entomological work. The determination of specimens, or the investigation of some obscure form of insect attack requested of me, may require the labor of days before suitable answer can be returned. Such calls, when coming from other and remote States of the Union, would more appropriately be sent to the Entomological Department at Washington, where, through its efficient corps of six assistants to the Entomologist, large provision is made for an amount of work of this character. Still, as scarcely a single study of the kind, coming to me from whatever source it may, can fail of contributing to the efficiency of this department, I have felt myself authorized in giving to them all the attention that their importance has appeared to demand.

The results of these examinations have been, from time to time, communicated by me to leading agricultural and scientific journals, that the information conveyed might not be limited to the individual replied to. Since the first of June, twenty-eight such publications have been made by me. Several of these will be available, after emendation and addition, for presentation in my annual report, or other publication by the State Museum.

### COLLECTIONS.

Under the act last above cited, the collections made by the Entomologist are to belong to, and form a part of, the collections of the State Museum. For reasons above stated, my collections during the past season have been quite limited. No excursions for the special purpose of collecting, were made by me. There was not the available time to devote to the immediate preparation for the cabinet which so large a

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\*First Annual Report | on the | Injurious and other Insects | of the | State of New York | made to the State Legislature, pursuant to chapter 377 of | the Laws of 1881, | by J. A. Lintner, | State Entomologist. | — | Issued, October, 1883. | — | Albany: | Weed, Parsons and Company, printers, | 1882. | — | 8vo., pp. xxii-381, figs. 84.

proportion of insects require, of a large amount of material, nor provision for its safe-keeping — much less for its display.

The total number of specimens collected and mounted is twelve hundred and twenty. They are contained in the several orders as follows :

Hymenoptera .....	50	Hemiptera.....	322
Lepidoptera .....	237	Orthoptera.....	17
Diptera .....	152	Neuroptera .....	25
Coleoptera.....	372	Biological.....	45

The number of species cannot at present be named, as much of the material has not yet been studied. A large portion of it will be available for distribution to the educational institutions of the State or for exchange.

In addition to the above, the following collections have been made :

Larvæ of Lepidoptera, etc., in alcohol, approximately.....	250
Unmounted Coleoptera, Hymenoptera, etc., approximately.....	350
Unmounted Biological specimens, approximately.....	500
Pupæ from larvæ collected, hybernating .....	180

The aggregate number of specimens collected, as appears from the above, is two thousand four hundred and fifty.

The collections have mainly been made in Middleburgh, Schoharie Co., at Elk lake, in Essex Co., in the town of Hammond, St. Lawrence Co., and in Albany.

#### INSECTS OF SPECIAL INTEREST.

Among those at Middleburgh were a number of *Trypetidæ*, of the group in which the wings are exquisitely marked with clouds and spots in the beautiful patterns which have been so admirably delineated in the four plates of Baron Osten Sacken, and the late Dr. Loew of Prussia, in their valuable monographs of this interesting family. These flies had seldom fallen under my observation before, and then in only single examples; but at this time (middle of July) and place they were not at all uncommon, traveling, with the strange movements peculiar to them, over the leaves of the milkweed (*Asclepias*) and wild parsnip (*Pastinaca sativa*), upon which the species may perhaps breed.

The time of my visit to Elk lake — Aug. 15-30 — was favorable for the collection of two species of butterflies which are rarely met with in this State, except in localities having high elevations, approximating that of Elk lake, which is 2,000 feet above tide. *Grapta Faunus* (Edw.) and *Grapta j-album* (Boisd.-Lec.) were comparatively abundant in the roadway leading to the lake, resting for a while upon the damp soil to imbibe its moisture and then flitting away to the adjoining shrubbery. Both species had evidently but just emerged from their pupal stage. Of another species of butterfly — *Feniseca Targuius* (Fabr.), which appears to be quite local in its distribution and to occur more frequently within this State, in the Adirondack region than elsewhere, several examples were captured, but all in indifferent condition, showing that they had already been abroad for a number of days. Its



larval food-plant is said by Mr. Glover to be hawthorn (*Crataegus*), but in this and in both previous instances in which the butterfly has been observed by me, it has been associated with alders (*Alnus* species), and where the hawthorn was not seen to occur.

An interesting illustration of the abundance at times and in certain localities of a particular species of insect, conjoined with the absence of other allied and perhaps more common forms, was given me at this locality. With a single exception, in a solitary example of *Catocala unijuga* (Walker), the only noctuid moth observed by me during my fortnight's sojourn here, was *Agrotis clandestina* (Harris). To add to the interest, all the examples had one common hiding-place, viz.: behind and about the sliding window-sashes of the exceedingly simple log structure that bore the euphonious name of the Elk Lake Hotel. The only conceivable attraction of such multitude of moths to their covert was a single kerosene hand-lamp, and later at night for a brief space of time, a candle in each of the four bed-rooms. Their assemblage in such numbers, under such circumstances, was a mystery to me. A sash could not be moved without disturbing a dozen of them. Hundreds could have been captured, but as many were in poor condition and the species is a common one, twenty-five examples only were brought away.

The black-fly, *Simulium molestum*, was abundant, but not very troublesome, for in the month of August it ceases to show the insatiable disposition to gorge itself with blood that it manifests in the preceding months. A number of specimens were captured and bottled for the museum collections as objects of interest to the many who have never recognized this minute yet most annoying pest of our northern wilderness.

Upon some cut poplars (*Populus tremuloides*) piled by the way-side, a large number of a wood-boring beetle, *Agrius torpidus* (Lec.), which I had never met with before, were observed alighting from their flight in the bright sunshine, and running in jerking motions actively over the bark. Its larva is doubtless a borer in the poplar. Sixty-two examples of it were taken.

### A NEW FORM OF INSECT ATTACK.

It would not be proper that at this time I should refer to more than a few of the many interesting insects, their habits and their attacks which have been brought to my notice during the past summer: I may, however, be permitted to mention two of these attacks.

We have long been familiar in Albany, with the ravages of the white-marked tussock-moth, *Orgyia leucostigma* (Sm.-Abb.), which annually, during the months of June and July, has made such formidable depredations upon the horse-chestnuts, elms, and maples bordering our streets, as to cause their foliage to present a most unsightly appearance. In years when the caterpillar which is the author of these injuries, has been unusually abundant, many of the trees, especially of the horse-chestnuts, have been entirely defoliated. It is this insect from which protection is sought by placing bands of cotton-batting loosely about the tree-trunks when the attack is first noticed — an effective preventive only in the event of the tree at the time being wholly free from

the pest, but of no utility whatever if the insect be already upon it, either as young larvæ or as egg-clusters attached to the branches. It is this insect also, which deposits its eggs upon its cocoon, to the number of two or three hundred, and covers them with a mass of viscid, white, frothy matter, which, hardening by exposure, subsequently remains for months or until discolored by age, as conspicuous objects when placed, as they often are, upon the trunks of elms and larger trees, readily arresting the eye of the passer-by.

This past summer, contemporaneously with the first appearance of the attack of the caterpillar upon the foliage, the sidewalks, streets and parks where the elm was growing, were seen to be strewn with its green leaves—in many places so thickly as completely to cover the walks or ground. Upon taking them up for examination, they were found to be the tips of the branches, comprising most of the new growth of the season. The portions thus thrown down were about three inches in length and contained from four to ten fresh, uninjured leaves. It was evident that they had not been broken off by an unusually high wind, for each day continued to add to the number and to increase the abundance of the fall. Making critical observation for the discovery, if possible, of so unusual a phenomenon, it was noticed that from above the point at which the twig had been broken, the bark was entirely removed for an extent averaging one-tenth of an inch. The manner of its removal showed it to have been eaten by an insect. From its character, together with the abundant presence of the caterpillar upon the trees at the time, I believed that it was the work of the *Orgyia*. If so, it was of especial interest, as this form of depredation, had never, to my knowledge, been previously observed. To verify the belief, I ascended to a house-top where the branches of a large elm projecting over the roof gave an excellent opportunity for examination. The larvæ were abundant upon the tree; the flat roof was strewn and heaped in corners with the broken-off tips; large numbers of the girdled twigs still held their place on the tree; and by careful search, larvæ were discovered in the act of eating the bark. From what was subsequently learned, the girdling had at this time nearly ceased.

From the above observations, the following explanation of the cause of the girdled and broken-off twigs of the elm may, I think, safely be given. Upon the eating away of the bark by the *Orgyia* caterpillar, the wood on exposure rapidly dried and soon became so brittle that from a moderate swaying of the branches the weight of a half dozen or more of large and succulent leaves would occasion the breaking of the slender twig—often not exceeding in its dried state the diameter of an ordinary pin.

For the occurrence at this time of this novel form of the *Orgyia* attack, I can offer but the following as a plausible explanation. The spring had been remarkably cold, and, as a consequence, the foliage of the trees had been delayed in development quite beyond the ordinary time. The sudden advent of warm weather caused a corresponding sudden start in vegetation followed by a vigorous growth, and the young twigs of the elm would, as the result, be unusually tender. The particular feeding-ground of many of the lepidopterous larvæ is known to be decided upon only after repeated tastings and rejections of

such portions of their food-plant as they traverse, and a final acceptance of that most agreeable to them. By a process like this the *Orgyia* larva may have made the discovery, that just at the commencement of the new growth, as the result of the seasonal conditions above mentioned, there was concentrated in the tender bark nutriment far more acceptable to it than that offered in the leaves, upon which alone it had hitherto been accustomed to feed. As the bark hardened with the advancing season it would cease to be acceptable for food.

The interesting query here arises, suggested by the frequency with which new habits in insects are brought to the notice of the entomologist: will the taste for bark newly acquired by the *Orgyias* of the last year, be conveyed, through heredity, to their descendants, to be continued through future years and displayed to an extent measured by the degree of tenderness of the bark at the period of their appearance?

The falling of the twigs, in the condition as above given, was first observed about the middle of June. Upon my return to Albany, after a fortnight's absence, on the 27th of July, twigs were still falling, but among them was a large proportion in which a new feature was presented. The breaking, instead of being at the base of the girdling, just above the commencement of the new growth, was, in these, at the preceding node, covering the growth of the former year. As a rule, the twigs showed a greater diameter at their decorticated portion, compared with those of the earlier fall. The greater strength thus given them permitted them to remain upon the tree until the death of the preceding internode, which soon followed the arrest of the circulation — its starvation ensuing, it being unprovided with leaves through which a circulation could still be maintained. When dead a slight motion of the branch, or even the weight of the terminal leaves would be sufficient to disconnect it at its lower and weaker node.

About the 1st of August the twigs ceased to fall. I have not made examination to see whether any of those upon which the above attack was made still remain upon the trees.\*

Nothing of the kind was observed as occurring upon the other principal food-plants of the *Orgyia*, viz.: the horse-chestnut and the maple, nor would it be expected in association with growth and structure so entirely different from that of the elm.

The same phase of attack was noticed by me in Troy, N. Y. I have seen no publication of its presence elsewhere, although the caterpillar was quite abundant in New York and other of our larger cities.

#### THE ENGLISH SPARROW PROMOTING INSECT INJURY.

In connection with the incidental mention above of the almost annual defoliation of so many of our more valuable shade-trees by the *Orgyia* caterpillars, it may be of interest to state that there is every reason to believe that we owe the commencement and regular returns of this annoying form of insect depredation to the introduction into our city, about the year 1868, of the English sparrow, *Passer domesticus*, and its subsequent rapid increase and diffusion. The sparrow does not feed upon the insect, but drives away the four species of birds



which are specially fitted by structure of bill for removing the skin from our hairy caterpillars previous to swallowing the nicely prepared tid-bit.

#### THE CHINCH-BUG IN NORTHERN NEW YORK.

Another insect attack, which has claimed my attention during the past season, presents so many interesting features, and threatens to be of so great importance to the agricultural interests of our State, that I beg leave to present to your board a report of my personal observations upon it. That it might be given the immediate publicity which, in view of the approach of winter, seemed so desirable, it was communicated to the *Albany Argus*, and was published in the issue of October 10. It is as follows :

During the last week in September a package of insects was sent to the State Agricultural Society, with the following statement in regard to them, from Mr. M. H. Smith, of Redwood, Jefferson county: "I herewith transmit specimens of (to us) a new and formidable grass-destroying insect, together with portions of grass destroyed by them, and also some of the soil, for the purpose of examination. If the insect is known to you and there is any known way to exterminate it, please inform us at once. The evidence of its destructive work was first discovered in June of 1882 by Mr. H. C. King, of Hammond, St. Lawrence county. At haying-time, about the middle of July, he noticed about three acres of his timothy grass to be apparently prematurely ripened. In the fall he observed that there was no aftergrowth, and that the stubble was as dead as if it had been boiled. Search was made among the dead roots without any discovery. The following spring the field was entirely barren of timothy, but some clover, weeds and thistles occupied the ground where at least one and one-half tons of timothy to the acre, under favorable circumstances, would have been cut. In June of 1883 Mr. King discovered other fields to be affected in the same manner, and instituted a search which has recently resulted in the discovery of myriads of the insect, not in the dead grass, but at the edge of the live grass, where they may be scraped up by handfuls. They have destroyed about fifteen acres for Mr. King and several acres for each of several other farmers of his vicinity. They are causing extreme alarm, and if you can give any relief from this calamity it will be gratefully appreciated. This is an important grazing locality. In addition to the timothy, June grass and wire grass are also destroyed."

*The insect identified.*—The insects being submitted to me by Secretary Harison, of the State Agricultural Society, I was compelled—although almost distrusting the evidence of my eyes—to recognize them as the notorious chinch-bug of the Southern and Western States. I had never before seen a New York specimen, nor had I knowledge of its occurrence within our limits, other than the record of Dr. Fitch, of his meeting with three individuals during the winter time upon willows. Dr. Harris, the eminent Entomologist of New England, had seen one specimen in Massachusetts. In each instance the occurrence was deemed of such interest that the date of observation was given.

Throughout the Southern or Western States, or more properly those lying within the "wheat-belt region," the chinch-bug is a well-known enemy, from the almost incredible amount of injury which it inflicts, in certain years, upon the grain and corn crops. Probably the aggregate of pecuniary losses which have resulted to the United States from its ravages have considerably exceeded those inflicted by any other of our thousand insect pests. In 1864, its injuries in the State of Illinois to wheat and corn alone were computed at seventy-three millions of dollars. This was a year of unusual excess, but it is not of rare occurrence that a State suffers a loss of from twelve to fifteen millions of dollars in a single year. When the insect abounds, it is so numerous as to cover the ground; it blackens the stalks of the plants upon which it feeds; it fills the air when, at seasons of its mating, it takes wing for flight; it marches to new feeding grounds in solid bodies, upon and over one another; its invading armies sweep over and utterly destroy a wheat or corn field in two or three days; and the nauseous bed-bug odor which they exhale, sickens those who are compelled to breathe it.

*Appearance of the insect.*—It belongs to the order of Hemiptera, which comprises all of the bugs proper. It is, therefore, without biting jaws, but takes its food by suction through a four-jointed proboscis, which, at rest, is bent beneath the body. Its size seems quite disproportioned to its destructive powers, being but about the one-tenth of an inch long, and one-third of its length broad. Its body is black and slightly hairy under a magnifier. The wing-covers, resting flat upon its back, are white, with a subtriangular black spot in the middle of the outer margin of each, and a few black veins upon their middle. The feet and swollen ends of the four-jointed antennæ are black, while elsewhere the latter and the legs are dull yellow.

*Observations upon the attack.*—In addition to the information contained in the communication of Mr. Smith above given, I am able to add the following from my personal observations made during the past week (on October 5th and 6th). The cold weather of the past few days (ice was formed upon three nights) has doubtless driven most of the bugs to their winter quarters for hibernation, in crevices, beneath boards, rails, etc., in rubbish heaps, and to many other secure retreats where such insects are accustomed to hide. Yet, upon parting the roots of the timothy, upon the borders of the killed portion, they were found in alarming numbers—in some spots sufficient to cover the ground with their bodies over an area of two or three inches in diameter, having apparently congregated in such places. In one spot, upon the warm sloping side of a dead furrow, they could be seen, in numbers, running like ants, over the ground. Elsewhere, they were concealed among the roots, near to and about the bulbs, upon which they appeared mainly to feed. Their presence in any spot could always be detected by bringing the nose near the ground by the peculiar bed-bug odor above mentioned. This method of detection proved more convenient and infallible than looking for them.

The invasion is more extended than was at first supposed. Nearly all of the farms in the neighborhood of Mr. King have been attacked, either last year or this, and discoveries of attack not before suspected

are, upon examination, being made daily. A present range of about eight miles is indicated. It is believed to occur throughout most of the town of Hammond, and to extend into Alexandria.

*Just cause for alarm.*— Without any desire to play the role of an alarmist, I feel it my duty to say that, as the result of my observations, this chinch-bug invasion of northern New York threatens to be the most serious insect attack to which our State has ever been subjected. The following are my reasons for this belief:

It has planted itself, maintained a footing, and has shown a rapid increase under unfavorable, unpropitious and unnatural conditions, such as these:

First. It is regarded as a southern insect (extending farther northward, as do most animal forms, in the Mississippi valley), yet it has appeared in the most northern county of the State, and upon (if the report be reliable) the St. Lawrence river.

Second. Its attack has been made upon timothy. This seems to be its most unusual food-plant, and, therefore, we infer, the least suited to it. All previous accounts concur in giving it a preference for spring wheat above all things else; next in order, oats or corn, and last the grasses. Timothy is only mentioned as occasionally attacked by it.

Third. In all previous accounts, great prominence has been given to its being a hot and dry weather insect, dependent upon these conditions, not only for its multiplication, but for its existence. Heavy rains have been claimed to be invariably fatal to it. It could not abound, it is stated, in a wet season. Dr. Fitch had even made recommendation of sprinkling it with water (an artificial shower), as the best means for its extermination. In the present instance, the bug obstinately persists in multiplying, contrary to all rule. The past year and the present have both been years of excessive rainfall in St. Lawrence county. Spring, summer and autumn have been exceptionally wet. In the spring, I am told that heavy and continued rains flooded meadows now showing the chinch-bug attack. At haying time, when the bugs were young, and, according to all the statements hitherto made, readily killed by wet, the rains were so frequent and severe, that the grass cut could only be secured with difficulty. Upon Mr. King's farm much of it was drawn in, upon favorable days, by improving the opportunity of extending the labor into hours after nightfall. At the present time grass is lying in fields in stacks, which could not be gathered, owing to continued rain, and fields of oats are still unharvested.

*Persistence of the attack.*— It is shown, by the above statements, that the insect has rapidly increased and largely extended its area during the present year, under conditions which should have been fatal to it. Why it has been otherwise may perhaps find its explanation in the fact that it is a new introduction into this part of the United States, and that it is following the law well known to prevail in the introduction from abroad (Europe, principally) of nearly all of our injurious insects. With scarcely an exception, with their importation they become far more destructive, causing greater ravages and often attacking new food-plants.



As the past history of the insect has shown that parasites and other enemies have entirely failed to arrest its multiplication, we are compelled to believe, from present indications, that it has come to stay, and that it will do so, unless effectual means are taken to prevent it. Its capability of increase is wonderful. Under the most conservative circumstances, a single chinch-bug, depositing its eggs about the first of June, would be, in the following August, the progenitor of a quarter of a million.

*Importance of arresting the attack.* — It should not be necessary to urge the importance of doing whatever can be done to arrest this attack, which threatens to be more serious to New York than was that of the wheat-midge, the loss from which, in some years, was computed at \$15,000,000. If it should continue to increase it will doubtless extend to wheat and corn and other of the grains. In its southern extension in this State it would naturally become more serious. At the present it is known in but two counties — Jefferson and St. Lawrence. It seems practicable by prompt, earnest and combined effort, to prevent its extension and to check it where it now exists. There is scarcely a doubt that had its presence in the two limited areas in the town of Hammond, last year, been known at the time, it might have been exterminated at a very moderate cost and with little labor. Had an area of about one acre of timothy been thoroughly showered with kerosene (diluted) by means of a street sprinkler or a more simple contrivance, upon the same plan, the attack should have been arrested.

*Remedial measures recommended.* — Unfortunately, at the present time a large proportion of the attacking insects seem to have left their feeding grounds and to have flown to winter quarters, where they may not be reached. Where they are still to be found among the roots of timothy, about the borders of the destroyed areas, I have recommended an immediate plowing under, by turning over a flat — not overlapping — broad furrow, of the greatest depth practicable, not less than eight inches. The insects could not survive this burial. When the condition of the dead grass will admit of burning, this should be done. A thin covering of straw first applied would aid materially in the burning. As early in the spring as practicable, the meadows should be heavily rolled in order to prevent the easy access of the hibernating bugs to the roots of the grasses for the deposit of their eggs.

Wheat fields should also be rolled for the same purpose, for an attack upon them may be expected the ensuing year. A wheat field of Mr. King seems to have been infested the present year, but to have been checked by its roots having been submerged by a heavy rainfall continued for several days.

The coming spring, as soon as the new attack is discoverable, in the month of June, the sprinkling with kerosene oil should be generally resorted to. The best method for diluting the oil by first making an emulsion of it with soap suds, and the degree to which it should be diluted will be stated hereafter in a more extended publication to be made, which will embrace the natural history of the insect, and other interesting details in relation to it.

ALBANY, October 8, 1883.



In consultation with your Secretary, it was thought best, in view of the alarming character of the attack, that general attention should be called to it throughout the infested region, and instructions given as to the best means for arresting it, particularly such as should be at once resorted to, in order to reach as large a portion as possible of the present brood. A circular of this character was accordingly prepared. An edition of three thousand copies was printed, and they have been very generally distributed throughout the portions of the State where the attack had been observed, together with such contiguous territory as it may be expected to reach in another season. The circular is herewith presented :

CIRCULAR No. 1. — OCTOBER, 1883.

NEW YORK STATE MUSEUM OF NATURAL HISTORY :  
DEPARTMENT OF ENTOMOLOGY.

*Directions for Arresting the Chinch-bug Invasion of Northern New York.*

Portions of St. Lawrence county, New York, are now suffering from a serious attack of the chinch-bug (*Blissus leucopterus*) — perhaps the most injurious of our insect enemies.

It has already, in the third year (probably) of its introduction, and the second year of the observation of its attack, spread to such an extent, and shown such a rapid increase under very unfavorable conditions, that a continued increase in its diffusion and destructiveness is probable, unless effectual measures can be taken to prevent it.

At present, only timothy and other grasses seem to have been attacked. Wherever attacked, the root is destroyed, and the grass, consequently, is entirely killed.

With its increase, its ravages would extend to wheat, rye, barley and corn, which are its favorite food-plants.

Its extension over the State of New York, as now threatened, would be attended with an annual loss of millions of dollars.

It seems practicable, at this stage, to prevent this extension, by earnest and combined effort throughout the district now invaded.

The most favorable time for this effort has already passed ; but much may be accomplished by immediate action.

As it is of very great importance that this destructive insect — the terror of our Southern and Western farmers — should not be permitted to obtain a permanent footing in our State, hitherto free from its depredations, a prompt and full compliance with the following directions is strongly urged :

1. Let every farmer in St. Lawrence county and adjacent counties in Northern New York (particularly in the western portion of St. Lawrence and northern of Jefferson), examine his meadows for patches of dead grass, looking as if winter-killed, indicating the attack of the insect. As an aid to its ready recognition, the infested areas upon the

farm of Mr. H. C. King, of the town of Hammond, St. Lawrence county, may be examined.

2. If the attack is detected, burn the dead grass and its surrounding border of fifteen or twenty feet not yet showing attack. This may be effectually done by first applying a covering of straw. A favoring wind is desirable for the purpose.

3. Plow the burned area (better still if the plowing extends beyond this limit and embraces the entire meadow) in broad and deep furrows, turning the sod completely and flatly over, not permitting it to lie in ridges.

4. To insure the more effectual burying of the insects that may be at present feeding upon, or preparing to pass the winter among, the roots of the grasses, harrow the plowed surface slightly, and follow with a heavy rolling.

5. Where the meadows will not permit of plowing as above, gas-lime, wherever it can be conveniently obtained from the gas-works at Ogdensburg, Watertown, etc., may be distributed over the ground, at the rate of 200 bushels to the acre. The gas-lime would also serve as a valuable fertilizer.

Of the above directions, the first four should be followed *at once*. The application of gas-lime might be postponed until the month of November, before the setting in of winter, or to the early spring. It should be confined to the dead and infested portions of the meadows, as in its fresh state it would kill the grass. In the winter, during February, it may safely be distributed over the entire fields, where it would probably serve the additional purpose of a preventive of a spring attack.

New attacks and more widespread distribution may be looked for about the first of June in the ensuing year. Directions for meeting these, by other methods, will be given hereafter.

It is hoped that every one interested will cheerfully comply with the above directions, and not render necessary a resort to compulsory legislation, which would undoubtedly call for a large increase of labor and expenditure. The agricultural interests of the State of New York may justly demand that, if possible to prevent it, the chinch-bug shall not be allowed to gain a permanent footing as a grain and grass destroyer within its borders. Its injuries in the State of Illinois, in a single year, were estimated at seventy-three millions of dollars — almost five times the amount computed for the wheat-midge ravages in New York, at the time of its greatest destructiveness.

OFFICE OF THE STATE ENTOMOLOGIST, *October 18, 1883.*



The CHINCH-BUG in natural size and as enlarged (about ten diameters). Color: black, with white wing-covers, having a black subtriangular spot on the outer margin of each, and two black veins nearer the base. The legs, the sucking-tube, and the base of the antennæ, are deep honey-yellow; the feet and the last joints of the antennæ are black. Length, about three-twentieths of an inch.

The young, appearing early in June and late in August, are blood-red, with a white band across their middle; later they change to brown and afterward to black.

I regret to have to report that the response given to the directions of the circular have fallen short of their requirement. Plowing under the infested areas has been quite general, but I do not learn that it has approached the thorough character recommended. Burning has not been resorted to, except upon the farm of Mr. King. The application of gas-lime will probably not be made, to any great extent, as it is reported as not easily to be obtained. Perhaps no other result should have been anticipated at this stage of the attack, or before the absolute necessity of vigorous action should be unmistakably apparent. Former experiences show that our farmers, as a rule, are indisposed to yield ready compliance with recommendations simply, although calculated to save them from serious pecuniary loss, particularly if such recommendations involve any expenditure beyond that of quite a limited amount of extra labor on their part. It would, therefore, seem to be a wise economy for the State whenever a continued extension of any formidable insect attack presents itself, that a prompt resort be had to effectual preventive measures, through legislation compelling the action desired and not otherwise to be had. Several laws for the prevention and destruction of injurious insects exist upon the statute books of European countries. In our own State and others there are laws against noxious weeds; and it would indicate an enlightened progress if there were also those controlling the unlimited spread of some of our more harmful insect pests.

The distribution of the above circular has brought to light the existence of the chinch-bug attack very generally throughout the western angle of St. Lawrence county; its presence on almost every farm in the town of Alexandria in Jefferson county, and elsewhere in

other northern towns of the same county; and also upon Deer river in the northern portion of Lewis county.

The re-appearance of the insect the coming season will be watched with much interest, as a test of the efficacy of the partial efforts put forth for its destruction. Although the late autumn and the winter up to the present have been favorable to its continuance, still I hope that the means already resorted to and those hereafter to be taken, will check the further distribution of this most dangerous pest throughout the State, and destroy it where it now exists.

#### CONCLUSION.

Not further anticipating the details of other insect studies which have engaged my attention during the past season, to be hereafter given in my regular annual report, I would state in conclusion :

The increasing recognition from various sources of the value of the investigations which are being made by this Department, are very gratifying to your Entomologist. They will serve to prompt him to, if possible, more earnest effort in the future, to the end that the great value to the State to the study of the insect world may continue to become more and more apparent until it shall be recognized by all in a cordial sympathy and aid extended to it.

Respectfully submitted,

J. A. LINTNER.

OFFICE OF THE STATE ENTOMOLOGIST, }  
ALBANY, *January 8, 1884.* }



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REPORT OF THE BOTANIST,  
1883.

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## REPORT.

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*To the Honorable the Board of Regents of the University of the State of New York:*

GENTLEMEN — The work of the year now past has been devoted to the poisoning, mounting and labeling of specimens of plants, to their collection, and in some instances to figuring them, in order to preserve as completely as possible the appearance and characters of the fresh growing plant, or to present to the eye at a glance the minute microscopic details and spore characters. Aid has also been rendered to several correspondents by identifying for them specimens of plants sent for that purpose, a work whereby knowledge is disseminated and the advantages of the herbarium are distributed and in a measure rendered available to those even who are not able personally to consult it. Attention has also been given to the examination of diseased specimens of cultivated plants, which have been sent for that purpose, in order that the cause of the affection might, if possible, be ascertained. Some time has also been spent in revising a part of the collection of fungi in the herbarium, the necessity for which is hereinafter set forth.

Specimens of one hundred and forty-nine species of plants have been mounted and added to the herbarium of the State Museum of Natural History, forty-four of which were not previously represented therein. The specimens of the remaining one hundred and five species serve to improve or render more complete the representation of the species or exhibit some form or variety of the plant not previously shown. The mounted specimens include both collected and contributed ones. A list of their specific names accompanies this report and is marked (A). A list of the names of contributors and of the species represented by their respective contributors is marked (B).

The operation of the Executive veto of the appropriation for the expenses of the Botanist in the year 1882 extended over a considerable part of the past year, consequently but little collecting could be done. The appropriation made for this purpose at the last session of the Legislature was not available until October first, the beginning of the present fiscal year, and then the season for field work had nearly closed. But a part of the summer was so favorable to the production of Agarici and other fleshy fungi that I was unwilling to let so good an opportunity pass unimproved. Accordingly I collected what I could in the counties of Albany and Rensselaer without incurring a greater expense than I was able and willing to bear out of my own pocket. The result was the collection of specimens of more than a hundred species of fungi, of which thirty-two are new to our State and several are new to science. The descriptions of the new species

are contained in a part of the report marked (C). I have also added to this part of the report descriptions of new species contained in the Thirty-second Report, but which were never published in such a way as to be generally available to the public or to those most interested in having them.

The recent publication of the second volume of Prof. P. A. Saccardo's great work, *Sylogæ Fungorum*, completes that part of the work which pertains to the Pyrenomycetous fungi and gives to mycologists a new system of arrangement and classification of the vast group of Sphæriaceous fungi. While this system recognizes as primary groups or families the Perisporiaceæ, Sphæriaceæ, Hypocreaceæ, Dothideaceæ, Microthyriaceæ, Lophiostomaceæ and Hysteriaceæ, the characteristics of which are based chiefly on external features, after the manner of the old system, it divides these families into sections whose characters are derived from the spores. By a most happy, simple and uniform system of nomenclature the very names of these sections are made to indicate their distinguishing characters and thereby to greatly simplify the system and facilitate the study, identification and classification of the numerous species. Many new genera have been introduced, some of which appear to be founded on rather slight characters, yet as a whole the system so ingeniously combines and employs both the external salient features and the internal spore characters of these fungi that it readily commends itself to favorable consideration. I am not aware that it has more than a single decided opponent, and in my opinion it will be adopted and followed in its general features by nearly if not quite all mycologists. I have, therefore, devoted some time to a revision of our collection of these fungi, that the nomenclature and arrangement of the specimens may keep pace with the advancement of the science and be in harmony with the new order of things thus introduced. This revisionary work is not yet fully completed. The great number of new genera requires the re-examination and re-labeling of many of the specimens. I have prepared a list of the names of our Sphæriaceous fungi, brought down to and including those of the thirty-first report, in which are placed in the left hand column the names as they stand under the new arrangement, in the right hand column the names as given under the former system of arrangement whenever they differ from the others. This list is marked (F).

A record of species new to our flora, but already described, new stations of rare plants, remarks upon new or noticeable varieties, etc., are given in a part of the report marked (D).

In pursuance of a plan devised for the purpose of giving to the public more complete and satisfactory descriptions of certain groups of our fungi than can be found in any works yet published. I have prepared monographs of the three genera, *Paxillus*, *Cantharellus* and *Craterellus*, so far as they are represented in our State. This part of the report is marked (E).

Respectfully submitted,

CHAS. H. PECK,

*Botanist.*

ALBANY, December 31, 1883.



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## (A.)

## PLANTS MOUNTED.

*Not new to the Herbarium.*

- Ranunculus abortivus*, *L.*  
*Podophyllum peltatum*, *L.*  
*Sarracenia purpurea*, *L.*  
*Sisymbrium officinale*, *Scop.*  
*Alyssum calycinum*, *L.*  
*Draba arabisans*, *Mx.*  
*Ampelopsis quinquefolia*, *Mx.*  
*Tilia Americana*, *L.*  
*Rhus typhina*, *L.*  
*Geranium Robertianum*, *L.*  
*Acer rubrum*, *L.*  
*Lupinus perennis*, *L.*  
*Lespedeza Stuvei*, *Nutt.*  
*Prunus Virginiana*, *L.*  
*P. serotina*, *Elrh.*  
*Cratægus pyrifolia*, *Ait.*  
*C. coccinea*, *L.*  
*Poterium Canadense*, *Gr.*  
*Potentilla recta*, *Willd.*  
*Rubus villosus*, *Ait.*  
*R. Canadensis*, *L.*  
*R. neglectus*, *Pk.*  
*Pyrus Americana*, *D. C.*  
*Saxifraga aizoides*, *L.*  
*Epilobium molle*, *Torr.*  
*E. palust. v. lineare*, *Gr.*  
*Apium graveolens*, *L.*  
*Lonicera oblongifolia*, *Muhl.*  
*Viburnum Lentago*, *L.*  
*V. Opulus*, *L.*  
*V. dentatum*, *L.*  
*Cornus alternifolia*, *L.*  
*Galium lanceolatum*, *Torr.*  
*Erigeron strigosus*, *Muhl.*  
*Cercopsis discoidea*, *T. & G.*  
*Lobelia Kalmii*, *L.*  
*Vaccinium corymbosum*, *L.*  
*Rhodora Canadensis*, *L.*  
*Cynoglossum officinale*, *L.*  
*Convolvulus arvensis*, *L.*  
*Calystegia sepium*, *L.*  
*Amarantus blitoides*, *Wats.*  
*Rumex Britanica*, *L.*  
*Corema Conradii*, *Torr.*  
*Morus rubra*, *L.*  
*Urtica gracilis*, *Ait.*  
*Carya porcina*, *Nutt.*  
*Quercus macrocarpa*, *Mx.*  
*Q. Muhlenbergii*, *Engelm.*  
*Abies nigra*, *Poir.*  
*Potamogeton pauciflorus*, *Pursh.*  
*Alisma Planta. v. Americanum*, *Gr.*  
*Najas major*, *All.*  
*Sagittaria variabilis*, *Engelm.*  
*Spiranthes Romanzoviana*, *Cham.*  
*Aplectrum hyemale*, *Nutt.*  
*Habenaria hyperborea*, *R. Br.*  
*Trillium erect. v. album*, *Pursh.*  
*Juncus Can. v. coarctatus*, *Engelm.*  
*Scirpus Smithii*, *Gr.*  
*Carex Steudellii*, *Kunth.*  
*C. Houghtonii*, *Torr.*  
*C. tetanica*, *Schk.*  
*C. virescens*, *Muhl.*  
*C. mirabilis*, *Dew.*  
*C. stram. v. festucacea*, *Boott.*  
*C. Hitchcockiana*, *Dew.*  
*Panicum dichotomum*, *L.*  
*P. Crus-galli v. hispidum*, *Muhl.*  
*Eragrostis capillaris*, *Nees.*  
*E. poeoides*, *Beauv.*  
*E. Purshii*, *Schrad.*  
*Danthonia spicata*, *Beauv.*  
*Cinna pendula*, *Trin.*  
*Festuca nutans*, *Willd.*  
*Asplenium Bradleyi*, *Eaton.*  
*Aspidium Goldianum*, *Hook.*  
*Botrychium lanceolatum*, *Angst.*  
*B. matricariaefolium*, *A. Br.*  
*Isoetes Engel. v. gracilis*, *Engelm.*  
*Azolla Caroliniana*, *Willd.*  
*Parmelia oliv. v. aspidota*, *Ach.*  
*Agaricus vaginatus*, *Bull.*  
*A. vulgaris*, *Pers.*  
*A. granulosus*, *Batsch.*  
*A. melleus*, *Vahl.*  
*A. arvensis*, *Schæff.*  
*A. petaloides*, *Bull.*  
*A. tener*, *Schæff.*  
*A. fœnisecii*, *Pers.*  
*A. præcox*, *Pers.*  
*A. flavescens*, *Pk.*  
*Hygrophorus borealis*, *Pk.*  
*H. luridus*, *B. & C.*  
*Lactarius distans*, *Pk.*  
*L. pyrogalus*, *Bull.*  
*Cantharellus cibarius*, *Fr.*  
*Russula nitida*, *Pers.*  
*R. flavida*, *Frost.*  
*R. variata*, *Banning.*  
*Polyporus brumalis*, *Pers.*  
*Hydnum zonatum*, *Batsch.*  
*H. graveolens*, *Delast.*  
*Phallus impudicus*, *L.*  
*Gnomoniella fimbriata*, *Sacc.*

*New to the Herbarium.*

*Sisymbrium canescens*, Nutt.  
*Lonicera Xylosteum*, L.  
*Scabiosa australis*, Wulf.  
*Hieracium Pilosella*, L.  
*Calamintha acinos*, Clær.  
*Atriplex hortensis*, L.  
*Carex hirta*, L.  
*C. flaccosperma*, Dew.  
*Phalaris Canariensis*, L.  
*Asplenium ebenoides*, Scott.  
*Agaricus pantherinus*, D. C.  
*A. infantilis*, Pk.  
*A. phyllophilus*, Fr.  
*A. pithyophilus*, Secr.  
*A. basidiosus*, Pk.  
*A. alcalinolens*, Pk.  
*A. aquosus*, Bull.  
*A. clavicularis*, Fr.  
*A. albinellus*, Pk.  
*A. Rodmani*, Pk.  
*A. fuscofolius*, Pk.  
*A. castanellus*, Pk.

*Agaricus bullaceus*, Bull.  
*Paxillus simulans*, Pk.  
*Lactarius albidus*, Pk.  
*L. cilicioides*, Fr.  
*L. lividus*, Pk.  
*L. deceptivus*, Pk.  
*Russula albida*, Pk.  
*R. uncialis*, Pk.  
*Cortinarius simulans*, Pk.  
*C. cinnabarinus*, Fr.  
*C. gracilis*, Pk.  
*C. praepallens*, Pk.  
*Hygrophorus virgineus*, Fr.  
*H. minutulus*, Pk.  
*Hydnum albidum*, Pk.  
*H. rufogriseum*, Pk.  
*H. hirsutum*, Pk.  
*H. scrobiculatum*, Fr.  
*Melanogaster Americanus*, Pk.  
*Valsa sepincola*, Fckl.  
*Cryptospora Betulae*, Tul.

(B.)

## CONTRIBUTORS AND THEIR CONTRIBUTIONS.

Mrs. S. M. RUST, Syracuse, N. Y.

*Atriplex hortensis*, *L.*

Mrs. I. B. SAMPSON, Albany, N. Y.

*Stellaria pubera*, *Mc.**Rhodora Canadensis*, *L.*

Mrs. C. M. FERRY, Oneida, N. Y.

*Agaricus trullisatus*, *Ellis.**Geaster hygrometricus*, *Pers.**Lenzites betulina*, *Fr.*

F. W. BATTERSHALL, Clyde, N. Y.

*Geranium Robertianum*, *L.*

Prof. W. G. FARLOW, Cambridge, Mass.

*Puccinia obscura*, *Schrœt.**Cercospora Pyri*, *Farl.*P. *Lantanæ*, *Farl.*C. *leptosperma*, *Pk.**Isariopsis pusilla*, *Fres.**Entyloma Lobeliæ*, *Farl.**Peronospora Linariæ*, *Fekl.*E. *Compositarum*, *Farl.**Microstroma leucosporum*, *Niessl.*E. *Menispermii*, *F. & T.*

A. B. SEYMOUR, Cambridge, Mass.

*Æcidium Hibisciatum*, *Schw.**Puccinia Tanacetii*, *D. C.*Æ. *Orobi*, *Pers.*P. *Gentianæ*, *Strauss.*Æ. *Amorphæ*, *Oke.*P. *Amorphæ*, *Curt.**Uromyces pyriformis*, *Oke.*P. *Hyssopi*, *Schw.*U. *Sparganii*, *C. & P.*P. *lateripes*, *B. & K.*U. *Junci*, *Schw.*P. *Kuhniæ*, *Schw.**Microsphæra elevata*, *Burrill.*P. *Silphii*, *Schw.*M. *erineophila*, *Peck.*P. *Aletridis*, *B. & C.*

Prof. WM. TRELEASE, Madison, Wis.

*Oidium irregulare*, *Pk.*



THIRTY-EIGHTH ANNUAL REPORT

ON THE

NEW YORK STATE MUSEUM OF NATURAL HISTORY,

BY THE

REGENTS OF THE UNIVERSITY

OF THE

STATE OF NEW YORK.

TRANSMITTED TO THE LEGISLATURE JANUARY 15, 1885.

ALBANY:  
WEED, PARSONS & COMPANY.  
1885.



# REPORT.

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*To the Legislature of the State of New York :*

The Regents of the University, as Trustees of the State Museum of Natural History, submit, as required by law, their thirty-eighth annual report.

With respect to the operations of the Museum, and the measures taken for its increase, the Trustees refer to the report of the Director, which is herewith transmitted. In like manner the reports which are appended of the State Entomologist and State Botanist will give in detail the important additions made to the collections in their respective departments, and the work carried forward by them in the scientific investigation of subjects committed to them. By the liberality of the Legislature small appropriations have been made for the expenses of both the Entomologist and Botanist in the prosecution of their researches, and the collection and preservation of specimens for the Museum. This will enable these officers to conduct their departments with greater efficiency than before.

In connection with the State exhibit at the New Orleans Exposition, the Director of the Museum prepared an interesting collection of material to be sent thither. The limited time allowed for the purpose, and the want of means to collect and prepare what would have been desirable, made the collection less complete than might have been wished. It contains, however, some things of unique value and interest, for a full account of which the Trustees refer to the report of the Director.

The Trustees are gratified to be able to announce to the Legislature that the several reports of the State Museum, whose publication for various causes has been delayed, some of them for several years, have all been printed and issued during the past year. This list includes the thirty-third, which was presented to the Legislature in 1880, down to and including the thirty-seventh, which was presented in 1884; in all, five reports. The Trustees are glad to feel assured that under the new law passed in 1883, which provides for the scientific printing of the Museum, to be done under the direct care of the Museum staff, will prevent a recurrence of such an accumulation of material. Under this law the scientific papers prepared by the Museum staff will be issued whenever ready as Museum bulletins. In all cases of scientific publications

the embarrassment and delay is occasioned by the cost and time required for the preparation of the illustrations. And it is impossible to procure such printing done with satisfaction under such a system of public printing as is provided by law for the legislative reports. The increased appropriation now provided for the Museum will enable the Trustees to print in appropriate style whatever the scientific workers of the Museum may prepare.

The Trustees announce to the Legislature that under the provisions of the law passed in 1883 the first of the new volumes on Palæontology was published last May. It is on the Lamellibranchiata, and contains descriptions and figures of the Monomyaria of the Upper Helderberg, Hamilton and Chemung groups. It is a volume of xvii and 268 pages, and is illustrated with forty-five plates. Another volume in this series is to be issued during 1885, which will be a continuation of the Lamellibranchiata. It is believed by the Trustees that under the provisions of this law this great and monumental work will be completed within the time designated.

The fitting up of the State Hall for the Museum, as provided by the law of 1883, has been necessarily delayed by the continued occupation of the building by the State officers. It may still require some time for the removal of all the departments of the government into the new Capitol, and until this is accomplished the plans of the Trustees for arranging the building cannot be carried out. In the mean time, however, the importance of providing fire-proof storage for the more valuable treasures of the Museum has led them to make a beginning. The east side of the third story of the building has been vacated, as well as several rooms in the basement. Accordingly the Trustees procured a careful measurement of the building, and a study of the means by which it might be adapted to the future wants of the Museum. Mr. Perry, Commissioner of the Capitol, kindly and gratuitously made the plans of the building and advised in reference to the repairs and changes which the building would require to adapt it to the purposes intended. Professor Hall, with the aid of Professor J. C. Smock, prepared a carefully devised scheme for the allotment of the space in the building. It is the purpose of the Trustees to carry out this plan and this allotment as rapidly as the room is vacated. The available space in the third story has been fitted up with drawers for the working and storage rooms of the future Museum, and the removal of the material to these rooms has been begun and will be carried forward as fast as possible.

It was found by the architect, when work on the rooms was begun, that the building itself was in need of material repairs. The roof required a thorough overhauling, and the chimneys and walls, and all the floors, not only in the rooms but the corridors, required to be relaid.



For the use of the building in the manner proposed it will require many additional changes. An elevator in the building is absolutely necessary, and some comprehensive system of heating by steam must be introduced. These changes and repairs in the building itself were not contemplated in the original law. The appropriation was intended and is probably sufficient for the fitting up with cases and furniture of the entire building. But the Trustees will be compelled to ask for the means to put the building itself in proper order for the full occupancy of the Museum.

The Trustees commend this great public institution to the continued liberality of the Legislature. It has been the work of many able men, and represents in a peculiar and noble sense the education, the culture, and the grandeur of the State. The Trustees are prepared to push forward the work of making this Museum, even more than now, useful to the State. They have plans for making it, in a true sense, a great educational center, from which influences shall reach every college and school in the State. These plans await the settled occupancy of a suitable and safe home for its extensive collections.

The Museum staff, as at present constituted, consists of James Hall, Director and State Geologist; J. A. Lintner, State Entomologist; Charles H. Peck, State Botanist; James W. Hall, assistant in charge of the zoölogical collections; John Gebhard, special assistant and guide. Charles E. Beecher has also been employed upon the work of the Museum in part, his services being otherwise given to the preparation of the Palæontology. It is proposed to add to this list another principal assistant, who shall supervise the removal of the Museum, and, as far as possible, leave the Director to give his time and strength to the preparation of his great work on Palæontology.

Respectfully submitted.

H. R. PIERSON,

*Chancellor.*



## REPORT OF THE DIRECTOR.

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ALBANY, *January 2, 1885.*

*To the Honorable the Board of Regents of the University of the State of New York :*

GENTLEMEN — I beg leave to communicate herewith the annual report upon the State Museum of Natural History, for the year 1884 (being the thirty-eighth report in the consecutive order); including a statement of the condition of the collections in the several departments, and the additions made thereto, a general account of the work done, and an enumeration of the publications made during the past year.

Since presenting my last report, the thirty-fifth, thirty-sixth and thirty-seventh Museum reports have all been issued, and also the reports of the State Geologist for the years 1882, 1883 and 1884, have all been printed and are ready for delivery. Some of these reports have been a long time awaiting publication, greatly to our disadvantage.

In order to complete the series of State Museum reports, we now require the reprinting of the thirty-second report, which exists only as a legislative document. As I have heretofore stated, there was no legislative order for the usual number of extra copies of that report, and the same was published without the map and plates which accompanied the report in its presentation to the Legislature. No copies of this report have ever been in the hands of the Regents, or of the Director, for public distribution, and it is very important that it should be republished without delay.

In the thirty-fifth report I have communicated a statement of the distribution of certain collections of fossils and minerals to colleges, normal schools, high schools and academies up to the date of that report. This statement does not include many smaller collections, of which we have no record. In the same report, I furnished a list of species of fossils used in the illustration of Vol. V, Part II, of the Palæontology of New York; to this I shall have occasion to refer more particularly. I also presented a catalogue of the Unionidæ of the Gould collection, of the New York State collection, and of the general collections of the Museum; also of the species of land shells of the United States possessed by the Museum. To these was added a list of the species of shells presented to the Museum by the late Dr. James Lewis, of Mohawk, N. Y. These catalogues may be of sufficient interest to have them printed

separately from the report, both for use in the Museum and for distribution to collectors and others.

In the same report, Mr. George B. Simpson contributed an important paper on the Anatomy and Physiology of *Anodonta fluviatilis*. A preliminary Notice, Part I,\* of the LAMELLIBRANCHIATA, *Monomyaria* has been published in the same report, in order both to give a wider circulation of the specific descriptions, and to fulfil a promise made many years since in the preliminary Notice, No. II, published in 1870.

The descriptions of corals (here published with illustrations) were issued in advance in pamphlet form in 1882.

With the thirty-fifth report, in 1882, I communicated a preliminary notice of some fossil reticulate sponges of the family Dictyospongidae. The same, accompanied by illustrations, was read before the American Association for the Advancement of Science, at the Montreal meeting in 1882, with a discussion of the relations of Dictyophyton, Phragmodictya, and similar forms with Uphantænia. The investigation was at that time incomplete, and it became impossible to finish the work in the time required for the publication of the report. The plates now published were lithographed in 1882, and a partial synopsis of the genera and species is given in this report. In the mean time the drawings, beyond those already lithographed, have been completed, the whole making about twenty quarto plates. The descriptions, amounting to about ninety pages of manuscript, were finished in April, 1884. The whole now awaits the determination of the Board of the Regents as to its mode of publication. This manuscript, together with the figures arranged on cards, will be laid before you.

A list of the titles of papers in these several reports named, and of the plates illustrating the same, will be appended to this report.

#### CURRENT WORK OF THE MUSEUM.

The work of the Museum, in the care and preservation of the collections already arranged in the cases and drawers, has been carried on as usual.

In the Zoölogical collection, the stuffed skins of mammals and birds have been cleaned and rearranged. The jars of alcoholic specimens have been cleaned and refilled. The collection of skulls and skeletons of mammals have been removed from their cases, cleaned and rearranged. and also the stuffed skins and skeletons of fishes. The cases of Echinodermata and Radiata have been cleaned and the collections rearranged. The Historical and Antiquarian collections have also received the necessary attention for their preservation.

The work of cutting and preparing translucent sections of corals and

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\* This paper was communicated with a previous report but afterward withdrawn and again communicated with the Thirty-fifth Report.



other fossils, and the cutting, shaping and polishing of specimens, has been continued as in former years. Our facilities for accomplishing this work have been brought into requisition, in preparing specimens for the New York State exhibit in the New Orleans Industrial Exposition. During the past year, 683 sections have been cut and polished, besides the cutting and polishing of many larger specimens.

The records of additions to the library, and to the collections, are appended to this report. The examination and partial analysis of numerous specimens of rocks, ores or other minerals, of which written or oral information has been given, regarding their character and value, has occupied considerable time. This information has been given from an inspection of the specimens or testing for certain metals which they were supposed to contain. This work has been done, with a view of benefiting the parties interested, and generally with a hope of saving them the expenditure of money in analysis of specimens which every mineralogist or geologist knows to be of no practical or economic value.

The Emmons collection of crystallized minerals has been cleaned, packed in boxes, and taken to the State Hall for arrangement in the cases in the south-east room of the upper story, to remain until the rooms assigned to the entire mineralogical collection shall be prepared for its reception.

The report of the Botanist will show you that in original research an unusual amount of work has been done in his department.

The preparation and study of new material has been going on in the palæontological department, especially among the Corals, the Bryozoans and the Lamellibranchiata; likewise the study of the reticulate sponges preparatory to publication. Since the first part of the fifth volume of Palæontology — Lamellibranchiata I — was published, the collections of species there described, belonging to the Museum, have been carefully labeled and arranged in drawers. This portion of the collection is now ready for the selection of the Museum series, and the distribution of duplicates to the colleges and academies.

Some progress has been made in the preparation and study of the microscopic sections of the fossil Brachiopoda. The thirty-fifth and thirty-sixth Museum reports contain plates illustrating some of the work done. During the year about 200 microscopic sections were made, and twenty-four photographic negatives prepared. A well-equipped photographic dark room has been constructed in one of the working-rooms of the State Hall, and during the coming year it is proposed to devote some time to the furtherance of these investigations.

Early in the last year many boxes of fossils were packed with the intention of storing them in the basement of the State Hall, but while we had not entire possession of the building, and until we could come into

complete control of the various rooms, it would have been unwise to use them for the storage of valuable specimens. The specimens to which I refer as prepared for removal, consist principally of large corals from the Upper Helderberg group, together with smaller specimens occupying several hundred drawers. It is hoped that during the present year the entire collection of fossil corals may be removed to the new quarters provided for them in the State Hall, and be properly arranged in drawers.

During the months of October, November and December, much time was spent by the Museum staff in preparing material for the State exhibit at the New Orleans Exposition. Owing to the limited time for preparation, and the small fund available, the exhibit is not as full nor as important as we could wish, still a fair display of the natural resources of New York is presented. Some of the leading features of the exhibit are as follows:

A geological column composed of large blocks of stone, representing the character and succession of the several rock formations of the State.

A collection of fossils containing the representative faunas of the New York palæozoic formations, comprising 323 entries, accompanied by a duplicate collection of 168 entries.

The principal building and ornamental stones of the State, the iron ores, and economic minerals were largely represented.

Copies of the lithographed plates of the Palæontology of New York, illustrating several classes of fossils, together with microscopic sections of the shells of Brachiopoda, and photo-micrographs of the same.

#### COLLECTIONS IN THE FIELD.

Considerable field-work became necessary for procuring the material destined for the New Orleans Exposition, and the Museum will profit by the accession of specimens collected, and by donations from parties who also contributed liberally to the Exposition material. These will be enumerated and due credit given to the contributors.

Five boxes of fossils were collected from the Chemung and Waverly groups of Warren county, Pennsylvania. These rocks are adjoining and a continuation of the New York formations, also a series of rock specimens to represent a section at that locality, from data furnished by Mr. F. A. Randall, and supplemented by the observations of Mr. C. E. Beecher. A geological section has been drawn to the scale of one inch to 100 feet, representing 1,900 feet of strata. The lower 1,100 feet show the rocks passed through in drilling for petroleum. This work is valuable in determining the probable horizon of the Panama conglomerate and its relations to the oil-bearing sands.

A collection of geological specimens was made from the Oneida con-

glomerate and Clinton group, near Ilion, N. Y. These will be useful in the Museum exchanges.

Two boxes of fossils and several large blocks of coralline limestone were obtained from Schoharie, and will afford valuable material for translucent sections of corals.

The additions to the various departments of the Museum, during the year 1884, will be found recorded in detail in the lists appended.

In the Botanical department, 151 species of plants have been received from twenty-three contributors. The State Botanist has collected 192 species of plants, of which 116 are new to the herbarium.

The Zoölogical collections have received specimens from four contributors. The principal addition is a collection of sixteen species of *Achatinella*, from Dr. W. D. Hartman, of West Chester, Pennsylvania.

The collections in Geology and Palæontology have received by donation sixteen specimens from six contributors, and by collection five boxes of fossils from Warren county, Pennsylvania; one box of fossils from Troy, N. Y., two boxes of Oneida conglomerate, Clinton iron ore and Clinton gray sandstone from Ilion, N. Y., two boxes of fossil corals from the coralline limestone of Schoharie, one box of fossils from Cortland, and nineteen large blocks of stone representing the Utica slate, Hudson river group, Tentaculite limestone, and Oriskany sandstone. Eleven specimens have been added by purchase, among which are seven very large and perfect examples of fossil reticulate sponges, from the Chemung group of Steuben county.

By donation and exchange, the library has received eighty-three books and pamphlets; ten volumes have been added by purchase.

The preparation for working and storage rooms in the upper story of the State Hall is so far advanced that some of the rooms may be occupied at once, and with the concurrence of the Secretary of the Board of Regents, I have already commenced to remove some of the valuable collections from the present Museum building to these rooms, which offer almost perfect security against fire. In this connection, and in regard to other collections of especial value now remaining in the present Museum building, I beg leave to call your attention to a recommendation made in my last report\* regarding the removal of such as these from the present unsafe Museum building to the State Hall, where they may be temporarily arranged or otherwise provided for. Should this proposition meet the approval of the Trustees, I would ask for authority to transfer the same as early as practicable.

Should it be necessary to remove some of the material now on public exhibition in the cases, I would suggest that other specimens be substituted from the duplicate collections. Nearly all the material which

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\* Thirty-seventh Report on the State Museum of Natural History, page 23.

I have suggested to be removed may be placed in drawers, and the remainder may be provided with floor cases, as now arranged in the Museum.

The upper story of the State Hall contains nine large rooms, of which five are situated to the east of the large corridor and are now in the possession of the Regents. These five rooms have been numbered for convenience 1, 3, 5, 7 and 9, beginning at the north-east corner of the building. The rooms with even numbers are on the west side of the corridor and are now used for the storage of State documents, except room No. 2, which contains cases and furniture, and lithographed plates belonging to the State Museum.

Room No. 1, on the north-east corner, is designed as a library and study for the Director. It is furnished with book-cases, desks, etc.

Room No. 3, adjacent to the preceding, contains thirty ranges of drawers, two and one-half inches deep, with twenty-four drawers in each range, making in all, 720 drawers. It is intended to use this room for the reception of collections which are being studied and described for the Palæontology of New York. The cases and drawers in this and the other rooms are finished in oak and are very substantial and elegant in appearance.

No. 5 has twenty ranges of drawers with twenty-four drawers in each range. This room was without light and used as a store-room for stoves, boxes, etc. A large sky-light has been put in which converts it into a well-lighted and useful room. A photographic dark-room has also been constructed in the south-east corner of this room, with complete arrangements for pursuing the work of photo-micrography already begun. The cases of drawers in No. 5 are designed for the collection of fossil corals of the Hamilton group.

Room No. 7 is especially adapted for the large collection of the fossil corals of the upper Helderberg group, and has twenty-three ranges of drawers three inches in depth, and seven ranges of drawers four inches in depth.

No. 9, on the south-east corner of the building, is a large, well-lighted room, and is intended to be used as a working-room for the arrangement and distribution of collections. It is furnished with cases along one side containing 288 drawers.

The rooms as now finished are arranged to contain 2,067 drawers, distributed as follows:

Room No. 3 will contain 720 drawers.

Room No. 5 will contain 480 drawers.

Room No. 7 will contain 579 drawers.

Room No. 9 will contain 288 drawers.

At the time of present writing there are 740 drawers fitted in the cases and ready for use.



When the present and proposed arrangements have been completed, the Museum will have the most convenient and ample working rooms of any similar institution in the country.

The Gould types of shells, and some other rare forms may be transferred to a safe position in the State Hall, and unless the Museum were to engage in some special biological work, there appears no reason to recommend the appointment of any special assistant in the department of Zoölogy.

Since the State Museum of Natural History was placed in charge of the present Director, workers in this department have increased more than a hundred fold, and a very large number of them are afforded facilities for investigation, from the various organizations sustained either by the general government or by richly endowed institutions, such as our limited means could never afford.

Professor A. Agassiz, the Director of the Museum of Comparative Zoölogy at Cambridge, presents in his last report some very important considerations regarding the management of museums and their collections. In the course of his discussions he remarks that "since the foundation of this Museum the conditions for scientific research in this country have greatly changed. The general government has now undertaken, in connection with the United States Coast and Geodetic Survey, with the Geological Survey, with the National Museum, and with the United States Fish Commission, an amount of scientific investigation in various directions which makes it a mere waste of time for those not officially connected with these government establishments to undertake certain lines of work. Recognizing this, it becomes at once apparent that it is a mere waste of time and money for us to continue accumulations of collections which will most certainly be duplicated at Washington or New York, and that, beyond a very limited appeal to the public in the collections placed on exhibition, we should expend our resources only in the direction of fostering such original work as may most efficiently be conducted by the professors holding endowed chairs in our University."

In this matter I would advise that the present collections be rearranged and relabeled, and that the only special efforts in this department be directed toward a full representation of the Zoölogy of the State of New York, in its principal divisions, which could be done at a moderate cost, and thus leave the resources of the Museum to be used in sustaining those departments wherever original research is required to be carried on.

Since we have dispensed with the services of a special assistant in the department of Zoölogy, and the services of a special taxidermist, the collection have been cared for and preserved in as good condition as

formerly. The additions made are not large, and there appears no good reason for incurring much expense in that direction. So long as the collections can be preserved from the ordinary destructive agencies by the present Museum staff, I see no reason for appointing special assistants to perform the work. Were we even to look upon the matter in its worst possible aspect, the salary of a special assistant would, in five years, be sufficient to replace the entire collection with fresh specimens. Of the stuffed skins, none can be regarded as types, or of special historic interest, and only a few of them are rare and difficult to be procured. I would therefore recommend that the special work which has heretofore devolved upon these assistants be henceforth performed, as in the past two years, by the assistant in charge of the Zoölogical department, with such temporary aid as he may require from time to time.

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LIST OF THE SEPARATE SCIENTIFIC PAPERS CONTAINED IN THE THIRTY-FIFTH, THIRTY-SIXTH AND THIRTY-SEVENTH REPORTS OF THE STATE MUSEUM, AND IN THE REPORTS OF THE STATE GEOLOGIST FOR THE YEARS 1882, 1883 AND 1884, AS PUBLISHED DURING THE YEAR 1884.

1. Notice of the machinery and methods of cutting specimens of rocks and fossils at the New York State Museum of Natural History. By James W. Hall, 3 pp. and 2 plates.
2. Report of the State Botanist for 1882. Chas. H. Peck, 40 pp.
3. A list of the Rhizopoda found in the vicinity of Albany, N. Y. By D. N. DeTarr, 3 pp.
4. Anatomy and Physiology of *Anodonta fluviatilis*. By George B. Simpson, 23 pp. and 11 plates.
5. The Aboriginal Work on Bluff Point, Yates county, N. Y. By S. Hart Wright, 2 pp. and 1 plate.
6. Notes on the Geology of Yates county, N. Y. By Berlin H. Wright, 12 pp., 1 plate and map of Yates county.
7. Descriptions of new species of Fossils from the Trenton group of New York. By C. D. Walcott, 8 pp. and 1 plate.
8. Preliminary Notice of the Lamellibranchiate Shells of the upper Helderberg, Hamilton and Chemung groups. By James Hall, 199 pp.
9. Descriptions of Fossil Corals from the Niagara and upper Helderberg groups. By James Hall, 58 pp. and 8 plates.
10. Descriptions of the species of Fossil Reticulate Sponges, constituting the Family Dictyospongiidæ. By James Hall, 17 pp. and 4 plates.

11. Illustrations of the structure of Strophomenoid Brachiopoda. By James Hall, 1 plate and explanation.
12. Report of the Botanist for 1883. Chas. H. Peck, 20 pp.
13. Some Abnormal and Pathologic Forms of Fresh-Water Shells from the vicinity of Albany, N. Y. By Chas. E. Beecher, 5 pp. and 2 plates.
14. Bryozoa (Fenestellidæ) of the Hamilton group. By James Hall, 16 pp.
15. On the Structure of the Shell in the Genus *Orthis*. By James Hall, 3 pp. and 2 plates.
16. Description of a new species of *Stylonurus* from the Catskill group. By James Hall, 2 pp. and 1 plate.
17. List of species of Fossils from an exposure of the Utica Slate and Associated Rocks, within the limits of the city of Albany. By C. E. Beecher, 1 p.
18. A Catalogue of the Published Works of James Hall, LL. D., 1836 to 1882. Communicated by Dr. David Murray, 16 pp.
19. A description of *Cryptozoon proliferum*. By James Hall, 1 plate and page of description and explanation.
20. Report of the State Entomologist for 1883. J. A. Lintner, 14 pp.
21. Report of the State Botanist for 1883. Chas. A. Peck.

*The following papers are from the Reports of the State Geologist for 1882-1884.*

22. Classification of the Lamellibranchiata. By James Hall, 8 pp. and 11 plates.
23. Discussion upon the manner of growth, variation of forms and characters of the Genus *Fenestella*, and its relations to *Hemitrypa*, *Polypora*, *Retepora*, *Cryptopora*, etc. By James Hall, 12 pp.
24. Fossil Corals and Bryozoans of the lower Helderberg group and Fossil Bryozoans of the upper Helderberg group. By James Hall, 33 plates and explanations. Palæontology of New York.
25. Brachiopoda, plates and explanations. By James Hall, 28 plates and explanations. Palæontology of New York.
26. Bryozoans of the Hamilton group. By James Hall.

JAMES HALL,

*Director of the State Museum of Natural History*

## ADDITIONS TO THE STATE MUSEUM DURING THE YEAR 1884.

## APPENDIX A.

## I. Botanical.

Specimens of *Trillium grandiflorum*, Salisb. var. *variegatum*, from Mrs. S. M. Rust, Syracuse, N. Y.

Specimens of *Trillium grandiflorum*, Salisb. var. *variegatum*, from Mrs. L. L. Goodrich, Syracuse, N. Y.

Specimens of *Juncus trifidus* L., from Prof. N. L. Britton, New York, N. Y.

Specimens of *Ledum latifolium* Ait., and *Andromeda polifolia* L., from Prof. O. R. Willis, White Plains, N. Y.

Specimens of eight species of fungi, from Prof. W. G. Farlow, Cambridge, Mass.

Specimens of three species of flowering plants and one entomophilous fungus, from Rev. J. L. Zabriskie, Nyack, N. Y.

Specimens of *Chondrioderma Michellii*, Lib. var. *sessile* Rostf., from Harold Wingate, Philadelphia, Pa.

Specimens of three species of Myxomycetous fungi, from George A. Rex, M. D., Philadelphia, Pa.

Specimens of three species of flowering plants, one of them, *Hydrangea arborescens* L., new to the herbarium, from E. A. Burt, Albany, N. Y.

Specimens of four species of flowering plants, from H. C. Gordinier, Troy, N. Y.

Specimens of *Castilleja coccinea*, Spreng., from D. Byron Waite, Springwater, N. Y.

Specimens of four species of flowering plants, one of them, *Listera convallarioides*, Hook., new to the State, and another, the very rare *Habenaria rotundifolia*, Rich., from Romeyn B. Hough, Lowville, N. Y.

Specimens of *Orontium aquaticum* L. and *Polygonatum biflorum* Ell., from J. D. Greenslete, Broadalbin, N. Y.

A specimen of *Lycoperdon giganteum* Oakes, from H. Andrews, Albany, N. Y.

A fine specimen of *Lycoperdon giganteum* Batsch., the giant puffball, from John D. Parsons, Albany, N. Y.

Specimens of an unusual form of *Uncinula spiralis* B. & C., a grape-leaf fungus, from D. A. A. Nichols, Dunkirk, N. Y.

Specimens of ten species of Characeæ, four of them new to the State, from T. F. Allen, M. D., New York, N. Y.

Specimens of monstrous development of two species of fungi from abandoned coal mines, from Prof. L. Lesquereux, Columbus, Ohio.

Specimens of four species of fungi, from Hon. G. W. Clinton, Albany, N. Y.

Specimens of eighteen species of fungi, from F. S. Earle, Cobden, Ill.



Specimens of *Secotium Warnei* Pk., from Aug. F. Foerste, Granville, Ohio.

Specimens of forty-nine species of fungi, from J. B. Ellis, Newfield, N. J.

Specimens of twenty-seven species of California fungi, from H. W. Harkness, M. D., San Francisco, Cal.

By collection of the Botanist, 192 species of plants, 116 of which are new to the herbarium. These are mostly fungi.

## II. Zoölogical.

Large red-headed wood-pecker (female), from Andrew Lackey, Johnsbury, Warren county, N. Y.

*Boa constrictor*, thirteen feet in length. *By purchase.*

Specimens of *Estheria*, from Des Moines, Iowa.

Specimens of *Pyrgula Nevadensis*, Pyramid Lake, Nevada, from R. Ellsworth Call, David City, Nebraska.

List of *Achatinella* presented to the New York State Museum by Dr. W. D. Hartman, February 29, 1884:

*A. adusta*, Pf., four specimens.

*A. affinis*, Newc., seven specimens.

*A. biplicata*, Newc., two specimens.

*A. Dunkeri*, Cuming, var. *Producta*, Rve., five specimens.

*A. elegans*, Newc., five specimens.

*A. flavescens*, Newc., two specimens.

*A. formosa*, Newc., two specimens.

*A. fulgens*, Newc., three specimens.

*A. Mastersi*, Newc., one specimen.

*A. pulcherrima*, Newc. type, five specimens.

*A. splendida*, Newc., two specimens.

*A. striatula*, Gould, ten specimens.

*A. textilis*, Fer.; *ventulus*, Rve. & Pf.; *microstoma*, Gould, six specimens.

*A. turgidula*, Pse., two specimens.

*A. variabilis*, Newc., six specimens.

*A. viridans*, Mighels, non Pf., five specimens.

## III. Geological and Palæontological.

Part of a mastodon tusk from Rochester, N. Y., found in the excavation of the Genesee Valley canal, 1837, from Prof. James Hall.

Plaster casts of the type specimens of *Echinocaris socialis*, *Tropidocaris bicarinata*, *T. interrupta*, *T. alternata* and *Elymocaris siliqua*, from C. E. Beecher.

Favosite from Freehold, Greene county; iron ore from Burden mine, Catskill, and piece of chert resembling a heel-bone, from C. H. Snyder, Freehold, N. Y.

Iron pyrites and iron ore from W. S. Snyder, Hoosick, N. Y.

Six specimens of *Dictyophyton tuberosum*, one specimen of *Dictyophyton patulum* from the Chemung group, Steuben county, N. Y. *By purchase* from Ward and Howell.

Plaster casts of *Stylonurus excelsior*, Catskill group, N. Y.

Plaster casts of *Cleodictya gloriosa*, lower Carboniferous, Indiana.

Plaster casts of *Dictyophyton cinctum*, Chemung group, Pennsylvania.  
 Plaster casts of *Dictyophyton parallelum*, Chemung group, New York.  
 Plaster casts of *Dictyophyton filitextile*, Chemung group, New York.  
 Plaster casts of *Equisetites* (?) *Wrightiana*, (a Crustacean) Chemung group, New York.

Five boxes of fossils of the Chemung and Waverly groups of Warren county, Pennsylvania. *By collection.*

One box of fossils from the dolomitic limestone breccia of Troy, N. Y. *By collection.*

Two large slabs of Potsdam sandstone. *By donation.*

One slab of Utica slate. *By purchase.*

Two blocks of Hudson river bluestone. *By collection.*

Two boxes of Oneida conglomerate, Clinton iron ore and gray sandstone of the Clinton group. *By collection.*

One block of Niagara limestone.

Two blocks of water limestone.

Six blocks of Tentaculite limestone. *By collection.*

Seven blocks of Coralline limestone. *By collection.*

Two boxes of corals from the Coralline limestone, Schoharie, N. Y. *By collection.*

Four blocks of Oriskany sandstone with fossils, Schoharie, N. Y. *By collection.*

One block of Goniatite limestone, Schoharie, N. Y. *By purchase.*

One block of Chemung sandstone, Ithaca, N. Y. *By purchase.*

One box of fossils from the Chemung group at Cortland, N. Y. *By collection.*

#### IV. Additions to the Library of the State Museum during the year 1884,—Donations and exchanges.

Additions to the library of the State Museum during the year 1884.  
 Donations and exchanges:

Official Gazette U. S. Patent Office, vol. 25, Nos. 12, 13; vol. 26, Nos. 1 to 13, incl.; vol. 27, Nos. 1-13, incl.; vol. 28, Nos. 1-14, incl.; vol. 29, Nos. 1 to 10 (Nos. 4 and 5 missing).

Alphabetical Lists of Patentees and Inventions for the half year, January to June, inclusive, 1883.

Alphabetical Lists of Patentees and Inventions for the quarter ending September 30, 1883.

Index of Decisions of the Commissioners of Patents, July-September, 1883.

Alphabetical Lists of Patentees and Inventions for the quarter ending December 31, 1883.

Alphabetical Lists of Patentees and Inventions for the quarter ending March 31, 1884.

Official Gazette U. S. Patent Office, index to vol. 28, April 1 to June 24, 1884.

Alphabetical Lists of Patentees and Inventions for the quarter ending June 30, 1884.

Annual Report of Commissioner of Patents, 1883.

Journal of the Cincinnati Society of Natural History, vol. VI, No. 4, December, 1883, and vol. VII, No. 1, April, 1884, vol. III, No. 2.

- Department of Agriculture, Chemical Division, Bulletin No. 1.  
 Department of Agriculture, Special Report, No. 5.  
 Department of Agriculture, Division of Statistics, Report No. 2.  
 Department of Agriculture, Division of Statistics, new series, Report No. 5 ; new series, Report No. 6, April, 1884 ; new series, Report No. 7.  
 Bulletin American Geographical Society, Nos. 3 and 4, 5 and 6, 1883.  
 Bulletin American Geographical Society, Nos. 1, 2, 1884.  
 Bureau of Education, Circulars of Information, No. 4, 1883 ; also "The Bufalini Prize," and "Education in Italy and Greece" (three pamphlets) ; Report of the Director of American School of Classical Studies at Athens, for the years 1882 and 1883.  
 Circulars of Information No. 5, 1883, and No. 1, 1884, Nos. 2 and 3, 1884, Nos. 4 and 5, 1884.  
 Cornell University Register, 1883, 1884.  
 Geological Map, Dr. F. V. Hayden, 1869-1880.  
 Canadian Record of Natural History and Geology ; Montreal, 1884.  
 Bulletin U. S. Fish Commission, vol. III, 1883 ; vol. II, 1882.  
 U. S. Commission of Fish and Fisheries, Commissioners' Reports, 1881, 1882.  
 Bulletin of the California Academy of Sciences, No. 1, February, 1884.  
 Proceedings of the Canadian Institute. Toronto, vol. II. Fasciculus, No. 1, March, 1884, and July, 1884, vol. II ; Fasciculus, 3, 1884.  
 Memoirs of the Boston Society of Natural History, vol. III, No. IX.  
 American Museum of Natural History, Bulletin, vol. I, No. V, February 13, 1884.  
 American Museum of Natural History, Annual Report, March, 1884.  
 Bulletin de la Societe Imperiale de Moscow, Nos. 3 and 4, 1882, and Nos. 1 and 2, 1883.  
 Johns-Hopkins University, Studies from the Biological Laboratory, vol. III, No. 1, March, 1884.  
 Isis in Dresden, Juli bis December, 1883.  
 Accessions to Indian Museum, Appendix A, quarter ending 30th September, 1883 ; quarter ending December 31, 1883 ; quarter ending 31st March, 1884 ; Appendices B, C and D.  
 Die Fortschritte Der Geologie, etc., C. F. Zincken, Leipzig, 1878.  
 Anales del Museo Nacional de Mexico, Tomo III, Eutrayo, 5<sup>a</sup>.  
 Beiträge zur Palæontologie von Oesterreich-Ungarn und den Angrenzenden Gebieten, E. v. Mojsisovics und M. Neumayr, Band I, Heft. 1, 2, 3, 4 ; Band II ; Band III, Heft. 1, 2, 3, 4 ; Band IV, Heft. 1 and 11, Juli, 1884.  
 Coins of Japan, by William Bramsen.  
 Japanese Chronological Tables, by William Bramsen.  
 Tables of Japanese Weights, by William Bramsen.  
 Tables of Japanese Lineal Measures, by William Bramsen.  
 Milwaukie under the Charter, vol. 3, J. S. Buck.  
 University of Nebraska, Catalogue, 1883, 1884.  
 A Contribution of our Knowledge of Palæozoic Arachnida, by S. H. Scudder, June 11, 1884.  
 Bulletins of Massachusetts Natural History, June, July, 1884.  
 Zur Geschichte der Ueberreste von *Alca impennis*, Linn. von Prof.

Dr. Wilh. Blasius, Naumburg, 1884; also two pamphlets: "*Spermo-philus rufescens*" and "*Alca impennis*."

Annual Report City Auditor, Boston, 1883 and 1884.

The Canadian Record of Science, Vol. 1, No. 1, Montreal, 1884.

Scientific Proceedings of the Ohio Mechanics' Institute, vol. II, No. 3, September, 1883.

Smithsonian (Regents) Report for 1881.

Report of Commissioner of Education, 1882 and 1883.

Contributions to the Geological History of the American Continent; the address of the retiring President, delivered before the first Montreal meeting of the American Association for the Advancement of Science, August, 1857, by James Hall. Salem, 1882, 8°, 42 pp., from the author.

Eurypteridæ from the Devonian and Carboniferous Formations of Pennsylvania, by James Hall. Harrisburg, 1884, 8°, 18 pp. and 6 plates, from the author.

Ceratiocaridæ from the Chemung and Waverly groups of Pennsylvania, by C. E. Beecher. Harrisburg, 1884, 8°, 22 pp. and 2 plates, from the author.

Notes on a Nevada Shell (*Pyrgula Nevadensis*), by R. E. Call and C. E. Beecher. Philadelphia, 1884, 8°, 5 pp., 1 plate, from the authors.

By purchase :

Photo-micrographs and how to make them, by George M. Sternberg. Boston, 1884, 8°, 204 pp., 19 plates.

Das Gebiss der Schnecken zur Begründung einer natürlichen Classification, untersucht von Dr. F. H. Troschel. Erster Band, Berlin, 1856-1863, 4to, 252 pp., 20 plates.

Zweiter Band, Berlin, 1866-1879, 4°, 246 pp., 24 plates.

Desmids of the United States and list of American Pediastrums, by the Rev. Francis Wolle. Bethlehem, Pa., 8°, 168 pp., 53 colored plates.

Science, vol. 2, Nos. 46 and 47; vol. 3, Nos. 48 and 49, 51 and 52 to 57, inclusive, Nos. 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73; vol. 4, Nos. 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97.

American Naturalist, January, vol. XVIII, No. 1; February, No. 2; March, No. 3; April, No. 4, May, No. 5; June, No. 6; July, No. 7; August, No. 8; September, No. 9; October, No. 10; November, No. 11; December, No. 12.

American Journal of Science, No. 157, vol. 27, January; No. 158, vol. 27, February; No. 159, March; No. 160, April; No. 161, May; No. 162, June; No. 163, July; No. 164, August; No. 165, September; No. 166, October; No. 168, December.

Nature, vol. 30, Nos. 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 23, 24, 25, 27; vol. 31, Nos. 1, 2, 3.

Encyclopædia Britannica, vol. 17.

Les Champignons de France, par G. C. Gillet, Texte, 1 col.; Atlas, 1 vol. Tableaux Analytiques des Hymenomycètes, par G. C. Gillet, 1 vol. Les Hymenomycètes, par G. C. Gillet Planches supplementaries 1-9 series.



## LIST OF MINERALS IN THE GENERAL COLLECTION OF THE MUSEUM.

## APPENDIX B.

## MINERALS.

This list is here presented not as a catalogue, but rather as a guide to the collection. It is a transcript of the labels upon the specimens, with some additions of mineralogical terms necessary to proper explanation, and the insertion of specific names in some cases, to make the arrangement conformable to the newer systems of classification. Wherever the localities could be recognized with certainty from the characters and known occurrence, they have been added. Doubts as to species and localities are indicated by the mark of interrogation. A few exceptions in the order of arrangement are due to a difference in the determination of the species, otherwise the arrangement in the cases and the order of numbering conform to the mineralogical system. The order of the list and of the collection in the cases agree; beginning at the west of the stairway in the case against the south wall in the third story, it continues to the corner and thence along the west wall to the front or street wall of the building. The reading is from left to right and from top downward in the several sections of the cases.

The sources of this general collection are in part here stated. All the specimens coming from the Van Rensselaer, Simms and Gebhard collections are thus credited. A few other donors are mentioned under their respective gifts.

The Brazilian collection was a donation from the National Museum of Rio de Janeiro. The list of minerals and ores in it was printed in the nineteenth annual report of the Regents on the State Cabinet, 1866.

The Pickett collection, principally one of fossils, was purchased for the Museum in 1867.\* The minerals in it are mostly from Lockport, N. Y., and from New England.

The Simms collection, consisting of minerals, fossils and ethnological implements, with some historical relics, was added, by purchase in 1870.†

The minerals of the Gebhard collection were received in 1872.‡ This collection was purchased for its fossils, and the minerals were incidental to it. The localities are omitted on many of the original labels.

The minerals of the Van Rensselaer collection were added in 1872.§ They were collected mainly in New England by the late Dr. Jeremiah Van Rensselaer, and the collection was the gift of Mrs. Van Rensselaer through T. L. Harison, Secretary of the New York State Agricultural Society. Owing to the bad condition of the wrappings and labels through exposure in a damp storage place previous to their reception, the localities were not identified.

\* Twenty-first Annual Report on Museum, pp. 20-21.

† Twenty-fourth Annual Report on State Museum, pp. 6, 7 and 27-28.

‡ Twenty-sixth Annual Report on State Museum, p. 7.

§ Twenty-sixth Annual Report on State Museum, pp. 7, 8 and 19.

The collection of zeolites and other minerals given to the Museum by Prof. A. R. Leeds, of Stevens' Institute, Hoboken, N. J., also deserves mention here. It came in 1877.\*

The specimens other than in collections above mentioned are, in part, the donations of many individuals, who have thus favored the Museum. They are referred to in the annual reports of the Regents on the State Cabinet and the State Museum.† A large part of this general collection has been gathered incidentally through the efforts of the Director and the numbers thus obtained cannot now be indicated.

The list contains 1,342 numbers, tallying with the number of specimens in the collection.

### *General Collection.*

#### Number.

- 1 Gold in quartz .....Chapel Hill, N. C.  
Presented by Dr. Crump.
- 2 Gold in quartz .....California.  
Presented by — Rothout.
- 3 Gold in quartz .....Grass Valley, Cal.  
Presented by George Pine.
- 4 Gold in quartz.....Pine Tree Vein, Mariposa, Cal.
- 5 Gold in quartz ..... Honduras, C. A.  
Pickett Collection.
- 6 Gold in quartz .....California. 132  
Simms Collection.
- 7 Gold in quartz .....California.  
Presented by Joseph Bigsby.
- 8 Gold in quartz, pyrite and silver blende,  
Mariposa, Pine Tree vein, Cal.
- 9 Gold with chalcopryrite.....Diamond Spring mine, Cal.
- 10 Gold with chalcopryrite.....Charlotte, N. C.
- 11 Gold in quartz .....Nevada.  
Pickett Collection.
- 12 Gold in trachyte.....
- 12a Silver amalgam.....California.
- 13 Copper with calcite.....Lake Superior.
- 14 Copper.....Lake Superior.
- 15 Copper.....Lake Superior.
- 16 Copper.....Lake Superior.
- 17 Copper.....Lake Superior.
- 18 Copper.....Lake Superior.
- 19 Copper with calcite.....Lake Superior.
- 20 Copper.....Lake Superior.
- 21 Copper.....Lake Superior.

NOTE.— The Emmons collection of crystallized minerals, purchased for the Museum in 1877, is not included in this list, as it is placed in cases in the State Hall.

\*Thirty-first Annual Reports on State Museum, p. 13.

† Annual Reports on State Cabinet and on State Museum I, pp. 6 and 21-33; II, p. 67; III, pp. 29-37; IV, pp. 73-79 and 82-90; V, pp. 35-43; VI, pp. 27-28; VII, pp. 51-57; VIII, pp. 25-26; IX, pp. 41-44; X, pp. 187-8; XI, p. 44; XII, pp. 108-9; XIII, pp. 17-19; XIV, pp. 13-14; XVI, p. 15; XVII, pp. 20-21; XVIII, pp. 11-12; XIX, pp. 39-41; XX, pp. 15-18; XXI, pp. 15-19; XXII, pp. 10-12; XXIII, pp. 17-19; XXIV, pp. 21-24; XXV, pp. 19-22; XXVI, pp. 19-20; XXVII, pp. 30-33; XXVIII, 23-25; XXIX, pp. 22-23; XXX, pp. 15-17; XXXI, p. 13; XXXII, p. 12; XXXIII, p. 6; XXXIV, pp. 16-17; XXXV, p. 15; XXXVI, pp. 18-19; XXXVII, p. 28; XXXVIII, p.

## Number.

- 22 Copper with calcite.....Lake Superior.  
 23 Copper.....Lake Superior.  
 24 Copper, calcite and heulandite.....Lake Superior.  
 25 Copper.....Lake Superior.  
 26 Copper.....Lake Superior.  
 27 Copper with calcite.....Lake Superior.  
 28 Copper.....Lake Superior.  
 29 Copper.....Lake Superior.  
 30 Copper.....Lake Superior.  
 31 Copper with calcite.....Lake Superior.  
 32 Copper.....Lake Superior.  
 33 Copper in trap.....Lake Superior.  
 34 Copper in trap.....Scovill Point, R. I.  
 35 Copper.....Lake Superior.  
 36 Copper.....Lake Superior.  
 37 Copper with prehnite.....Lake Superior.  
 38 Meteoric iron.....South Africa.  
     Presented by Professor Shepard.  
 39 Meteoric stone, fell in Bethlehem, Albany Co., August 11, 1859.  
 40 .....  
 41 Arsenic (crude).....  
     Presented by Peter Colburn, Esq.  
 42 Arsenic.....Ouro Preto, P. de Minas.  
     Brazilian Collection.  
 43 Arsenic.....Freiberg ? Saxony.  
 44 Arsenic.....Freiberg ? Saxony.  
 45 Bismuth in quartz.....Monroe, Conn. 135  
     Gebhard Collection.  
 46 Bismuth in quartz.....Monroe, Conn.  
     Gebhard Collection.  
 47 Tellurium.....Melonch mine, Amador Co., Cal. 219  
 48 Native sulphur.....New Grenada, S. A.  
 49 Native sulphur and celestite.....Sicily ? Italy.  
 50 Native sulphur and gypsum.....Auburn, N. Y.  
     Presented by F. Starr.  
 51 Native sulphur and celestite.....Sicily ? Italy.  
 52 Native sulphur.....New Grenada, S. A.  
 53 Native sulphur and celestite.....Sicily, Italy.  
 54 Native sulphur.....Mexico.  
 55 .....  
 56 Graphite.....Ticonderoga, Essex Co.  
     Presented by Hon. Robert Hale, June, 1874.  
 57 Graphite.....Barreiras, P. de Minas, Brazil. 10  
 58 Graphite with calcite.....Ticonderoga, Essex Co.  
     Presented by Hon. Robert Hale, June, 1874.  
 59 Graphite.....Ticonderoga, Essex Co.  
     Presented by Hon. Robert Hale, June, 1875.  
 60 Graphite with calcite.....Port Henry, Essex Co., N. Y.  
 61 Graphite.....Johnstown, N. Y.  
 62 Graphite with calcite.....Port Henry, Essex Co.  
 63 Molybdenite in quartz.....  
     Van Rensselaer Collection.

## Number.

64 Molybdenite.....	Gebhard Collection.	
65 Orpiment.....	Germany.	158
66 Stibnite.....	Gebhard Collection.	
67 Stibnite.....		
68 Stibnite .....		
69 Stibnite .....		
70 Stibnite .....		
71 Stibnite .....	Gebhard Collection.	
72 Galenite .....	Martinsburgh, Lewis Co., N. Y.	175
	Beck Collection.	
73 Galenite with quartz.....	Taubaté P. de S. Paulo.	
	Brazilian Collection.	
74 Galenite with pyrite, containing trace of gold,	Amazon lode, Gilpin Co., Col.	
75 Galenite (argentiferous) .....	Iporanga, P. de Parana.	85
	Brazilian Collection.	
76 Galenite .....	Alaethé, P. de Minas.	88
	Brazilian Collection.	
77 Galenite with calcite .....		
78 Galenite (argentiferous), \$300 p. ton....	Washington Co., Nev.	
79 Galenite and calcite (scalenohedron).....	Van Rensselaer Collection.	
80 Galenite .....	Rossie, St. Lawrence Co.	
81 Galenite .....	Rossie, St. Lawrence Co.	
82 Galenite and calcite .....	Van Rensselaer Collection.	
83 Galenite and calcite....	Van Rensselaer Collection.	
84 Galenite and iron pyrites.....	Van Rensselaer Collection.	
85 Galenite and calcite.....	Van Rensselaer Collection.	
86 Galenite.....	La Motte mine, Mo.	
	From J. S. Schoonmaker.	
87 Galenite.....	Santa Fé, New Mexico.	
	From G. W. Pine.	
88 Galenite with sphalerite.....	Flat Creek, Montgomery Co.	
89 Galenite .....		
90 Galenite .....		
91 Galenite .....	Allegrete, P. de S. Pedro de Sul.	86
	Brazilian Collection.	
92 Galenite, iron pyrites, etc.....	Brazilian Collection.	90
93 Galenite.....	Galena, Ill.	
	From Duncan Campbell.	
94 Galenite.....	Galena, Ill.	
	From Duncan Campbell.	
95 Bornite .....	Buena Esperanza.	



## Number.

96	Bornite .....	Bristol, Conn.	
97	Bornite .....	Minas de Hegura Coquimbo, Chili.	
98	Bornite .....		
99	Alabandite .....		
	Van Rensselaer Collection.		
100	Alabandite .....		
101	Sphalerite in quartz .....	Alaethe, P. de Minas.	
	Brazilian Collection.		
102	Sphalerite in quartz .....		
	Van Rensselaer Collection.		
103	Sphalerite .....		
	Van Rensselaer Collection and pyrite.		
104	Sphalerite in Trenton slate .....		
105	Sphalerite .....	Jasper Co., Ark.	
106	Sphalerite .....	Derbyshire, Eng.	
107	Sphalerite in dolomite, Niagara group, Rochester, Monroe Co.		
108	Sphalerite in dolomite, Niagara group, Rochester, Monroe Co.		
109	Sphalerite, Galenite and Calcite .....	Jasper Co., Ark.	
110	Sphalerite .....		
	Van Rensselaer Collection.		
111	Sphalerite .....		
	Van Rensselaer Collection.		
112	Sphalerite .....		85
	Brazilian Collection.		
113	Chalcocite and quartz .....		
	Van Rensselaer Collection.		
114	Chalcocite .....	Bristol, Conn.	
	Pickett Collection.		
115	Chalcocite .....		
	Van Rensselaer Collection.		
116	Chalcocite, Serpentine and Calcite .....	Keweenaw Pt., L. S.	
117	Cinnabar .....		
	Church Collection.		
118	Cinnabar .....		
	Church Collection.		
119	Cinnabar .....		
	Church Collection.		
120	Cinnabar .....		
	Church Collection.		
121	Cinnabar .....		
	Church Collection.		
122	Cinnabar .....		70
	Brazilian Collection.		
123	Cinnabar in schist .....	Villarica, P. de Minas.	
	Brazilian Collection.		
124	Pyrrhotite .....	Bodenmais, Ger.	
	Van Rensselaer Collection.		
125	Pyrrhotite .....	Bodenmais, Ger.	
	Van Rensselaer Collection.		
126	Pyrrhotite nickeliforous .....	Jay, Essex Co.	
127	Niccolite .....		

## Number.

- 128 Skutterudite.....
- 129 Erythrite (Cobalt bloom) .....
- 130 Erythrite (Cobalt bloom and Cobaltite?).....
- 131 Pyrite .....  
Van Rensselaer Collection.
- 132 Pyrite ..... Schoharie, Schoharie Co., N. Y.  
Beck Collection.
- 133 Pyrite ..... Watervliet, Albany Co., N. Y.  
J. D. Darling.
- 134 Pyrite auriferous in quartz.....Torquim, P. de Minas.  
Brazilian Collection.
- 135 Pyrite ..... Schoharie, N. Y.
- 136 Pyrite .....  
Pickett Collection.
- 137 Pyrite ..... Schoharie, N. Y.
- 138 Pyrite and Galena .....  
Van Rensselaer Collection.
- 139 Pyrite ..... Schoharie, N. Y.
- 140 Pyrite ..... Gouverneur, N. Y.  
Pickett Collection.
- 141 Pyrite ..... Schoharie, N. Y.
- 142 Pyrite ..... Schoharie, N. Y.
- 143 Pyrite ..... Schoharie, N. Y.
- 144 Pyrite ..... Schoharie, N. Y.
- 145 Pyrite ..... Schoharie, N. Y.
- 146 Chalcopyrite and quartz ..... Sheffield, Mass.  
From N. T. Brownell.
- 147 Chalcopyrite ..... Honduras.  
Pickett Collection.
- 148 Chalcopyrite ..... Lake Superior.  
From B. Known, Syracuse.
- 149 Chalcopyrite.....
- 150 Chalcopyrite ..... California.  
Pickett Collection, Canton, St. Lawrence Co.
- 151 Chalcopyrite .....
- 152 Chalcopyrite with quartz ..... San Juan, Mexico.
- 153 Chalcopyrite and pyrite.....Central City, Col.  
Containing gold, silver and nickel.
- 154 Chalcopyrite in quartz and feldspar..... Bristol, Conn.
- 155 Chalcopyrite with Calcite.....
- 156 Chalcopyrite .....  
Van Rensselaer Collection.
- 157 Chalcopyrite with pyrite.....
- 158 Chalcopyrite ..... Wurtsborough, Sullivan Co., N. Y.
- 159 Chalcopyrite.....  
Pickett Collection.
- 160 Arsenical pyrites.....Edenville, Orange Co.  
Beck Collection.
- 161 Arsenical pyrites.....  
Brazilian Collection.
- 162 Arsenopyrite.....Edenville, Orange Co.

## Number.

- 163 Arsenical pyrites ..... Caldbeck Fells, Cumberland, Eng.  
 164 Arsenopyrite.....Edenville, Orange Co., N. Y.  
     Gebhard Collection.  
 165 Arsenopyrite and quartz.....California.  
 166 Scorodite .....  
     Brazilian Collection.  
 167 Aikinite .....  
     Van Rensselaer Collection.  
 168 Tetrahedrite .....South America.  
     Presented by Señor Asta.  
 169 Tetrahedrite, Galenite and Chalcopyrite .....  
 170 Pyrargyrite.....Freiberg, Saxony.  
 172 Halite, rock salt.....Cheshire, Eng.  
 173 Halite, rock salt .....Cheshire, Eng.  
 174 Halite, rock salt .....Cheshire, Eng.  
 175 Halite, rock salt .....Cheshire, Eng.  
 176 Halite, rock salt .....Cheshire, Eng.  
 177 Silver ore .....Siberia.  
 178 Silver ore .....Blue Ophir Ledge, Cal.  
     Simms Collection.  
 179 Silver ore.....California.  
 180 Fluorite.....  
     Gebhard Collection.  
 181 Fluorite and Galena.....  
     Brazilian Collection.  
 182 Fluorite .....  
 183 Fluorite (green) .....Cumberland, Eng.  
 184 Fluorite .....Derbyshire, Eng.  
 185 Fluorite and Barite.....  
     Van Rensselaer Collection.  
 186 Fluorite .....  
 187 Fluorite.....  
     Gebhard Collection.  
 188 Fluorite.....  
     Gebhard Collection.  
 189 Fluorite.....  
     Gebhard Collection.  
 190 Fluorite (polished).....Matlock, Eng.  
 191 Fluorite.....  
 192 Fluorite.....  
     Gebhard Collection.  
 193 Fluorite.....Muskelonge lake, Jefferson Co., N. Y.  
     Pickett Collection.  
 194 Fluorite and pearl spar.....Rochester, N. Y.  
 195 Fluorite (purple).....  
     Van Rensselaer Collection.  
 196 Fluorite on Blende.....Matlock, Eng.  
 197 Fluorite (octahedral).....  
     Van Rensselaer Collection.  
 198 Fluorite (veined).....Derbyshire, Eng.  
 199 Yttrocerite in Calcite .....Amity, Orange Co.

Number.	
200	Cryolite.....Greenland. From R. C. Ross.
201	Fluorite..... Van Rensselaer Collection.
202	Fluorite..... Van Rensselaer Collection.
203	Fluorite..... Gebhard Collection.
204	Cuprite.....Honduras.
205	Cuprite..... Gebhard Collection.
206	Cuprite and Malachite.....Chili, S. A. Pickett Collection.
207	Cuprite.....Bound Brook, N. J.
208	Cuprite..... Van Rensselaer Collection.
209	Cuprite and Malachite..... Van Rensselaer Collection.
210	Massicot (Oxide of lead).....Galena, Ill. Pickett Collection.
211	Zincite and Franklinite.....Franklin, N. J. Van Rensselaer Collection.
212	Zincite and Franklinite.....Franklin, N. J. Simms Collection.
213	Zincite and Franklinite.....Franklin, N. J. Van Rensselaer Collection.
214	Zincite and Franklinite.....Franklin, N. J. Van Rensselaer Collection.
215	Zincite and Franklinite.....Franklin, N. J. Van Rensselaer Collection.
216	Zincite and Franklinite.....Franklin, N. J.
217	Melaconite..... Van Rensselaer Collection.
218	Melaconite.....Minas de Andacollo.
219	Melaconite.....Honduras. Pickett Collection.
220	Melaconite and copper..... Gebhard Collection.
221	Melaconite.....Flemington, N. J.
222	Melaconite.....Lake Superior.
223	Corundum (Sapphire, blue).....New Jersey.
224	Corundum (Sapphire, blue).....New Jersey.
225	Corundum (Sapphire, blue).....Newton, Sussex Co., N. J.
226	Corundum (Sapphire, blue).....Newton, Sussex Co., N. J.
227	Hematite (Specular iron ore)..... Van Rensselaer Collection.
228	Hematite (Specular iron ore)..... Van Rensselaer Collection.
229	Hematite (Specular iron ore).....Gouverneur, N. Y.
230	Jasper on hematite..... Van Rensselaer Collection.



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231	Hematite (Specular iron ore)..... Van Rensselaer Collection.	
232	Hematite (Specular hematite) .....	Lake Superior.
233	Hematite (Micaceous oligiste) .....	Itabira, P. de Minas. 53 Brazilian Collection.
234	Hematite (Lamellar oligiste) in quartz, Serra da Gameleira, Bahia	44
235	Hematite .....	61 Brazilian Collection.
236	Hematite (Micaceous oligiste).....	Itabira, P. de Minas. 57 Brazilian Collection.
237	Hematite (Oligiste).....	Cabaceiro, Rio Grande de Norte. 51 Brazilian Collection.
238	Hematite (Lamellose oligiste) Mine of Tente Casimero, P. de Minas.	54 Brazilian Collection.
239	Hematite (Oligiste ochreous) .....	Santaram, P. de Pará. 55 Brazilian Collection.
240	Hematite (Specular iron) .....	68 Brazilian Collection.
241	Chromite .....	Van Rensselaer Collection.
242	Hematite (Oligiste).....	Serra d'Araripe, P. de Ceará. 45 Brazilian Collection.
243	Hematite.....	Bagé, Rio Grande de S. Pedro do Sul. 46 Brazilian Collection.
244	Hematite (Itabyrite and Amphibolite) Itabirado Campo, P. de Minas.	52 Brazilian Collection.
245	Hematite .....	Brazilian Collection.
246	Hematite .....	
247	Hematite.....	
248	Hematite (Oligiste), in part hydrated..	Caxias, P. de Maranhao. 56 Brazilian Collection.
249	Hematite.....	Iron mountain, Mo.
250	Hematite (Specular iron) .....	Van Rensselaer Collection.
251	Hematite with quartz.....	Potsdam, St. Lawrence Co., N. Y.
252	Martite.....	Arnold bed, Clinton Co., N. Y.
253	Martite.....	Loudonville, Albany Co., N. Y.
253a	Martite .....	From J. F. Flannery.
254	Hematite (Lenticular iron ore) .....	Pennsylvania. 56
255	Hematite.....	Pennsylvania.
256	Hematite (Lenticular iron ore)...	Clinton, Oneida Co., N. Y.
257	Menaccanite (crichtonite)...Serra de Nassouras P. de Minas.	67 Brazilian Collection.
258	Menaccanite, replacing mica in granite, Potsdam Junction, St. Lawrence Co., N. Y.	
259	Magnetite .....	Essex Co., N. Y.

## Number.

260 Spinel.....	Van Rensselaer Collection.	
261 Spinel.....	Van Rensselaer Collection.	
262 Spinel.....	Van Rensselaer Collection.	
263 Spinel.....	Edenville, Orange county.	
264 Spinel (red) .....	Vernon, N. J.	
265 Spinel, in Trachyte .....	Germany.	
266 Spinel.....		
267 Spinel.....	Van Rensselaer Collection.	
268 Spinel.....	Amity, Orange Co., N. Y.	
	Beck Collection.	
269 Spinel.....	Amity, Orange Co., N. Y.	
270 Spinel.....	Amity, Orange Co., N. Y.	
271 Spinel.....	Amity, Orange Co., N. Y.	
272 Spinel.....	Amity, Orange Co., N. Y.	
273 Spinel.....	Amity, Orange Co., N. Y.	
274 Spinel (ruby) .....	Amity, Orange Co., N. Y.	
275 Spinel.....	Warwick, Orange Co., N. Y.	
	Beck Collection.	
276 Cassiterite .....	Cornwall, Eng.	
277 Cassiterite, in granite .....	Rio Paránpeba, P. de Minas.	69
	Brazilian Collection.	
278 Magnetite .....	Moriah, Essex Co., N. Y.	
279 Magnetite.....	Barton Hill mine, Moriah, Essex Co., N. Y.	
280 Magnetite.....	Palmeriodos Indios, P. de Alageas.	58
	Brazilian Collection.	
281 Magnetite.....	Barton Hill mine, Moriah, Essex Co., N. Y.	
282 Magnetite .....	Forest of Dean mine, Orange Co., N. Y.	
283 Magnetite.....	Forest of Dean mine, Orange Co., N. Y.	
	From W. C. H. Sherman.	
284 Magnetite.....	Barton Hill mine, Essex Co., N. Y.	
285 Magnetite.....	S. Jo de Ypanema, P. de S. Paulo.	59
	Brazilian Collection.	
286 Crystals of magnetite .....	Cocoas, P. de Minas.	60
	Brazilian Collection.	
287 Magnetite (iron sand) .....	Lake Champlain, N. Y.	
288 Franklinite and zincite.....	Franklin, N. J.	
	From Prof. James Hall.	
289 Franklinite and zincite .....	Franklin, N. J.	
290 Franklinite and zincite .....	Franklin, N. J.	
291 Franklinite and zincite .....	Franklin, N. J.	
292 Magnetite.....		
293 Franklinite iron.....	Sussex Co., N. J.	
	From Geo. R. Howell.	
294 Magnetite.....	Van Rensselaer Collection.	
295 Siderite (and Uraninite ?) .....	Cornwall, Eng.	
296 Uraninite.....		

## Number.

297	Chrysoberyl.	Haddam, Conn.	
298	Chrysoberyl.		
299	Chrysoberyl.	Greenfield, Saratoga Co., N. Y.	
300	Chrysoberyl.		
301	Chrysoberyl.	Haddam, Conn.	
302	Rutile.		
303	Manganite.	Nazareth, P. de Bahia.	81
	Brazilian Collection.		
304	Manganite.	Antonio Pereira, P. de Minas.	65
	Brazilian Collection.		
305	Manganite.	Antonio Pereira, P. de Minas.	66
	Brazilian Collection.		
306	Manganite.	S. Jeronymo, P. de S. Pedro, de Sul.	82
	Brazilian Collection.		
307	Proylusite.		
	Van Rensselaer Collection.		
308	Pyrolusite.		
	Van Rensselaer Collection.		
309	Pyrolusite.		
	Van Rensselaer Collection.		
310	Pyrolusite.		85
311	Pyrolusite on Limonite.	Salisbury, Conn.	
312	Pyrolusite.	Germany.	
	Van Rensselaer Collection.		
313	Pyrolusite.	Germany.	
314	Brucite.	Woods' mine, Lancaster Co., Pa.	
	Pickett Collection.		
315	Turgite on Limonite.	Fort Ann, Washington Co., N. Y.	
316	Limonite.	Obidos, Para.	48
	Brazilian Collection.		
317	Limonite (Brown hematite, Stalactitic).	Itabira, P. de Minas.	50
	Brazilian Collection.		
318	Limonite (mammillary)		
319	Limonite (botryoidal).	Salisbury, Conn.	
320	Limonite.	Salisbury, Conn.	
	From H. Averill.		
321	Limonite.	Salisbury, Conn.	
322	Limonite.		
323	Limonite.		
324	Limonite (fibrous)	Bennington, Vt.	
	Simms Collection.		
325	Limonite.	Litchfield, Conn.	
	Pickett Collection.		
326	Limonite (fibrous)		
327	Limonite.	Iron Mt., Missouri.	
	Pickett Collection.		
328	Limonite.	Salisbury, Conn.	
329	Limonite.	Salisbury, Conn.	
330	Limonite.	Fort Ann, Washington Co., N. Y.	
331	Limonite (slaty)	Ceritiba, P. de Parana.	
	Brazilian Collection.		

## Number.

- 332 Limonite.....Salisbury, Conn.  
From B. F. Otterson.
- 333 Limonite.....Fort Ann, Washington Co., N. Y.
- 334 Limonite.....Parana, Brazil.
- 335 Limonite (bog ore) .....Saratoga Co., N. Y.  
Pickett Collection.
- 336 Limonite (bog ore) .....Glen, Montgomery Co., N. Y.  
Simms Collection.
- 337 Hematite ..... P. de Sergippe, Brazil?
- 338 Brucite on serpentine.....Hoboken, N. J.  
From Prof. Leeds.
- 339 Brucite with marmolite.....Hoboken, N. J.
- 340 Brucite in serpentine .....Hoboken, N. J.
- 341 Brucite .....Hoboken, N. J.  
From Prof. Leeds.
- 342 Gibbsite.....Pa.  
Simms Collection.
- 343 Gibbsite.....Pa.  
Simms Collection.
- 344 Gibbsite.....Richmond, Mass.
- 345 Gibbsite.....Steamboat, Pa.  
Pickett Collection.
- 346 Gibbsite .....  
Gebhard Collection.
- 347 Gibbsite.....Richmond, Mass.
- 348 Bismite.....Clausthal, Bohemia.
- 349 Bismite .....Catla Branca, P. de Minas.  
Brazilian Collection.
- 350 Quartz (crystals) .....  
Van Rensselaer Collection.
- 351 Quartz (Rock crystal) .....
- 352 Quartz (Rock crystal) .....
- 353 Quartz (Rock crystal) .....
- 354 Quartz (Rock crystal) .....
- 355 Quartz.....Easton, Pa.  
Simms Collection.
- 356 Quartz.....
- 357 Quartz.....
- 358 Quartz.....
- 359 Quartz.....
- 360 Quartz (crystals) .....Middleville, Herkimer Co., N. Y.  
Simms Collection.
- 361 Quartz penetrated by stibnite.....
- 362 Quartz.....
- 363 Quartz.....
- 364 Quartz (crystals) .....
- 365 Quartz.....Craigville, Orange Co.  
Beck Collection.
- 366 Quartz.....St. Lawrence Co., N. Y.
- 367 Quartz.....Rossie, St. Lawrence Co., N. Y.
- 368 Quartz.....  
Van Rensselaer Collection.



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369	Quartz.....	Dauphiny, France. Pickett Collection.
370	Quartz.....	Pickett Collection.
371	Quartz.....	Ellenville, Ulster Co.
372	Quartz, calcite and galenite.....	Van Rensselaer Collection.
373	Quartz.....	
374	Quartz.....	Van Rensselaer Collection.
375	Quartz (Hyaline).....	Brumado, P. de Minas. 28 Brazilian Collection.
376	Quartz (Drusy) barite and malachite,	Catskill, Greene Co., N. Y.
377	Quartz (Hyaline).....	Itambe P. de Minas. 29 Brazilian Collection.
378	Quartz coated with chlorite.....	Van Rensselaer Collection.
379	Quartz.....	Fowler, St. Lawrence Co., N. Y.
380	Quartz.....	Van Rensselaer Collection.
381	Quartz.....	Van Rensselaer Collection.
382	Quartz (yellow) ...	Rossie, St. Lawrence Co., N. Y.
383	Quartz.....	
384	Quartz.....	Northern N. Y. Pickett Collection.
385	Quartz.....	Van Rensselaer Collection.
386	Quartz (crystals).....	Trout lake.
387	Quartz.....	Jefferson Co., N. Y. Pickett Collection.
388	Quartz.....	
389	Quartz.....	Rossie, St. Lawrence Co., N. Y.
390	Quartz.....	Dotterval, P. de S. Pedro. Brazilian Collection.
391	Quartz (Rock crystal) with calcite..	Moriah, Essex Co., N. Y.
392	?	
393	Quartz (Rock crystal).....	Spraker's Basin, Montgomery Co.
394	Quartz crystals in limestone. W. Canada creek, Newport, N. Y.	
395	Quartz.....	Fowler, St. Lawrence Co., N. Y.
396	Quartz.....	Van Rensselaer Collection.
397	Quartz.....	Pickett Collection.
398	Quartz.....	Bear Valley, Mariposa Co., Cal. Near Col. Fremont's residence.
399	Quartz.....	Wurtsboro mine, Sullivan Co., N. Y. Beck Collection.
400	Quartz.....	Iserlohn, Germany.
401	Quartz (milky).....	

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402	Quartz on ferruginous sandstone.....	
	Van Rensselaer Collection.	
403	Quartz .....	
404	Amethyst .....	
	Van Rensselaer Collection.	
405	Amethyst .....	
	Van Rensselaer Collection.	
406	Quartz (geode) amethyst.....	
	Van Rensselaer Collection.	
407	Amethyst .....	
	From Dr. Chas. Martin.	
408	Amethyst (geode) .....	
	Simms Collection.	
409	Amethyst .....	
410	Amethyst.....	gold mine, California.
411	Amethyst.....	P. de Minas, various places.
	Brazilian Collection.	35
412	Rose quartz ....	Pedro Lavrada, P. de Rio Grande do Norte.
	Brazilian Collection.	30
413	Rose quartz .....	
414	Rose quartz ..	Mt. Washington, N. H.
	From J. V. L. Pruyn.	
415	Rose quartz .....	Rubinstein, Bavaria.
416	Smoky quartz .....	
417	Smoky quartz and feldspar.....	
	Van Rensselaer Collection.	
418	Smoky quartz .....	
419	Smoky quartz .....	
420	Smoky quartz ...	Old iron ore bed, Moriah, Essex Co., N. Y.
421	Smoky quartz .....	Essex Co., N. Y.
422	White quartz.....	Bergen, N. J.
	From Prof. Leeds, Hoboken.	
423	Quartz and albite .....	Pennsylvania.
	Simms Collection.	
424	Chalcedony .....	
	Pickett Collection.	
425	Chalcedony .....	Alabama.
426	Quartz (geode) .....	
427	Chalcedony .....	Alabama.
428	Chalcedony ....	Alabama.
429	Chalcedony .....	
430	Chalcedony.....	Alabama.
431	Chalcedony .....	Bosphorus, Asia Minor.
432	Chalcedony .....	Massachusetts.
433	Chalcedony with Magnetite .....	
434	Chalcedony and selenite.....	Rochester, N. Y.
	Pickett Collection:	
435	Chalcedony .....	
436	Chalcedony.....	Terro de St. Roque, S. Pedro do Sul.
	Brazilian Collection.	31
437	Chalcedony .....	

Number.	
438 Chalcedony .....	Mt. Lebanon, Syria.
439 Chalcedony .....	
440 Chalcedony .....	
441 Chalcedony .....	
442 Chalcedony .....	
443 Chalcedony .....	
Pickett Collection.	
444 Chalcedony .....	
445 Chalcedony .....	
446 Chalcedony .....	North part of Yellowstone park, Montana.
447 Chrysoprase .....	
Gebhard Collection.	
448 Chrysoprase .....	Mähren, Germany.
449 Chrysoprase .....	Bound Brook, N. J.
450 Chrysoprase .....	Baumgarten, Germany.
451 Agate .....	Ireland, 354
Simms Collection.	
452 Agate .....	
453 Agate .....	Rock of Gibraltar.
Simms Collection.	
454 Moss agate .....	
455 Agate .....	Rio Jaguarao, Brazil.
456 Agate .....	
457 Agate .....	
458 Agate .....	
459 Agate .....	
460 Agate .....	Rio Jaguarao, S. Pedro do Sul, Brazil. 32
461 Agate .....	Rio Jaguarao, S. Pedro do Sul.
Brazilian Collection.	
462 Agate (Seixas rollados) .....	Rio de S. Francisco do Norte. 33
Brazilian Collection.	
463 Jasper .....	Saugus, Mass. 68
Simms Collection.	
464 Jasper .....	
Simms Collection.	
465 Agate .....	Rio Jaguarao, P. de S. Pedro do Sul. 34
Brazilian Collection.	
466 Jasper and specular iron (boulder) .....	Grand Rapids, Mich.
Pickett Collection.	
467 Flint .....	157
Gebhard Collection.	
468 Flint in chalk .....	England.
Pickett Collection.	
469 Quartz (Siliceous concretions) .....	
470 Hornstone .....	
471 Hornstone .....	
472 Wood-opal .....	Alexandria, Va.
473 Wood-opal .....	Mt. Diablo, Cal.
Simms Collection.	
474 Silicified wood .....	
Pickett Collection.	

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- 475 Precious opal..... Gebhard Collection.
- 476 Common opal.....
- 477 Common opal.....
- 478 Common opal..... Van Rensselaer Collection.
- 479 Chalcedony..... Keokuk, Iowa. (?)
- 480 Opal..... Gallatin Co., Mont.
- 481 Opal-agate..... Van Rensselaer Collection.
- 482 Opal-agate..... California.
- 483 Silicified wood..... California.  
From Hon. Charles Daly.
- 484 Menilite..... Van Rensselaer Collection.
- 485 Menilite..... Bohemia.  
Gebhard Collection.
- 486 Menilite..... Van Rensselaer Collection.
- 487 Cacholong in amygdaloid.... Partridge island, Nova Scotia.  
Pickett Collection.
- 488 Hyalite..... Vesuvius, Italy.
- 489 Silicified wood..... Wyoming territory.  
From a log 12 feet long, 10 inches in diameter.
- 490 Enstatite (bronzite) fluorite and serpentine,  
Amity, Orange Co., N. Y.
- 491 Enstatite..... Amity, Orange Co., N. Y.
- 492 Hypersthene rock.....
- 493 Wollastonite..... Essex Co., N. Y.  
Pickett Collection.
- 494 Wollastonite..... Essex Co., N. Y.  
Pickett Collection.
- 495 Wollastonite..... Lewis, Essex Co., N. Y. 1061  
Pickett Collection.
- 496 Pyroxene..... Van Rensselaer Collection.
- 497 Pyroxene, crystals.....
- 498 Pyroxene..... Monroe, Orange Co., N. Y.
- 499 Pyroxene..... Warwick, Orange Co., N. Y.
- 500 Pyroxene (coccilite).....
- 501 (Coccilite) with quartz and magnetite,  
Port Henry, Essex Co., N. Y.
- 502 (Coccilite)..... Long pond, Essex Co., N. Y.
- 503 Pyroxene... Greenwood furnace, Monroe, Orange Co., N. Y.
- 504 Canaanite (white pyroxene)..... Canaan, Conn.
- 505 Jeffersonite (2 specimens)..... Franklin, N. J.
- 506 Jeffersonite..... Franklin, N. J.
- 507 Jeffersonite..... Franklin, N. J.
- 508 Acmite..... Norway.
- 509 Rhodonite..... Cummington, Mass.  
Pickett Collection.



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- 510 Rhodonite .....Cummington, Mass.  
Pickett Collection.
- 511 Rhodonite .....Cummington, Mass.  
Pickett Collection.
- 512 Spodumene .....Sterling, Mass.
- 513 Petalite.....  
Pickett Collection.
- 514 Petalite .....Bolton, Mass.  
Gebhard Collection.
- 515 Amphibole (Tremolite).....  
Van Rensselaer Collection.
- 516 Amphibole (Tremolite).....
- 517 Amphibole (Tremolite).....Canaan, Columbia Co, N. Y.  
Gebhard Collection.
- 518 Amphibole (Tremolite).....Dover, Dutchess Co., N. Y. 309  
Beck Collection.
- 519 Amphibole (Tremolite), Gouverneur, St. Lawrence Co., N. Y.
- 520 Amphibole (Tremolite)..... Port Henry, Essex Co., N. Y. 1047  
Beck Collection.
- 521 Amphibole (Tremolite).....Edenville, Orange Co., N. Y.
- 522 Amphibole (Tremolite), Kane's quarry, Westchester Co., N. Y. 494  
Beck Collection.
- 523 Amphibole (Tremolite).....  
Van Rensselaer Collection.
- 524 Amphibole (Tremolite) .....Amity, Orange Co., N. Y. 612  
Beck Collection.
- 525 Amphibole (Tremolite)..... Patterson, Putnam Co., N. Y. 329  
Beck Collection.
- 526 Amphibole (Tremolite).....Edenville, Orange Co., N. Y.
- 527 Amphibole (Tremolite) ..... Sheffield, Mass.
- 528 Amphibole (actinolite) .....Middlefield, Mass.
- 529 Amphibole (actinolite)..... Middlefield, Mass.
- 530 Amphibole (actinolite).....Middlefield, Mass.
- 531 Hornblende and talc.....  
Van Rensselaer Collection.
- 532 Hornblende .....
- 533 Hornblende .....
- Van Rensselaer Collection.
- 534 Hornblende .....Fitchburg, Mass.  
Pickett Collection.
- 535 Hornblende .....Yonkers, Westchester Co., N. Y. 517  
Beck Collection.
- 536 Hornblende .....
- Van Rensselaer Collection.
- 537 Sahlite .....
- Gebhard Collection.
- 538 Hornblende.....Edenville, Orange Co., N. Y.  
Beck Collection.
- 539 Hornblende .....
- 540 ? .....
- 541 Hornblende.....  
Van Rensselaer Collection.

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542	Hornblende .....	Amity, Orange Co., N. Y.
543	Hornblende .....	Crag Harbor, Essex Co. 1033
	Beck Collection.	
544	Hornblende .....	New Rochelle, Westchester Co., N. Y. 414
	Beck Collection.	
545	Hornblende, Spruce Swamp mine, Monroe, Orange Co., N. Y. •	
	Gebhard Collection.	
546	Actinolite .....	
	Van Rensselaer Collection.	
547	Hornblende .....	
	Gebhard Collection.	
548	Hornblende and quartz .....	
	Van Rensselaer Collection.	
549	Hornblende .....	Monroe, Orange Co., N. Y. 354
	Beck Collection.	
550	Hornblende, Cumingtonite .....	
	Gebhard Collection.	
551	Hornblende .....	Rossie, St. Lawrence Co., N. Y. 226
552	Hornblende .....	Piermont, Rockland Co., N. Y. 1062
	Beck Collection.	
553	Hornblende .....	South East, Putnam Co., N. Y. 81
	Beck Collection.	
554	Hornblende .....	
	Van Rensselaer Collection.	
555	Anthophyllite, Hydrous .....	New York city.
556	Anthophyllite .....	New York city.
557	Anthophyllite .....	
558	Anthophyllite .....	Bucks Co., Pa.
	From Prof. Leeds, Hoboken.	
559	Pargasite .....	Vermont.
560	Pargasite and chondrodite .....	Vernon, Sussex Co., N. J.
561	Asbestos .....	Quarantine, Staten Island. 358
	Beck Collection.	
562	Asbestos .....	Staten Island, N. Y.
	From Prof. Leeds, Hoboken.	
563	Asbestos .....	
564	Asbestos .....	
565	Asbestos .....	DeKalb, St. Lawrence Co., N. Y.
566	Amianthus .....	P. de Minas, Brazil. 39
	Brazilian Collection.	
567	Asbestos .....	Massachusetts.
	Pickett Collection.	
568	Asbestos .....	Wilks mine, Orange Co., N. Y.
	Beck Collection.	
569	Beryl .....	Acworth, N. H.
570	Beryl .....	Acworth, N. H.
571	Beryl .....	Acworth, N. H.
	Pickett Collection.	
572	Beryl .....	
	Van Rensselaer Collection.	
573	Beryl .....	Monroe, Orange Co., N. Y.

Number.	
574 Beryl .....	Acworth, N. H. Pickett Collection.
575 Beryl.....	Monroe, Orange Co., N. Y.
576 Beryl.....	Monroe, Orange Co., N. Y.
577 Beryl.....	Van Rensselaer Collection.
578 Beryl.....	Van Rensselaer Collection.
579 Beryl.....	Van Rensselaer Collection.
580 Beryl.....	Monroe, Orange Co., N. Y.
581 Boltonite .....	Bolton, Mass. Pickett Collection.
582 Chrysolite.....	Valvesais, France.
583 Chrysolite .....	
584 Chrysolite (olivine lava).....	Vesuvius, Italy.
585 Chrysolite .....	Batschwald, Ger.
586 Furnace slag .....	Palmer's furnace, Buffalo, N. Y. Pickett Collection.
587 Furnace slag .....	Pickett Collection.
588 Willemite and Franklinite .....	Franklin, N. J. From Prof. Leeds.
589 Willemite, zincite, etc .....	Sterling Hill, N. J.
590 Willemite, zincite, etc.....	Franklin, N. J.
591 .....	
592 Garnet.....	Yonkers, Westchester Co., N. Y.
593 Garnet.....	Van Rensselaer Collection.
594 Garnet .....	Rogers' Rock, Essex Co., N. Y. 532 Beck Collection.
595 Garnet.....	Van Rensselaer Collection.
596 Garnet.....	Van Rensselaer Collection.
597 Garnet .....	
598 Garnet .....	Van Rensselaer Collection.
599 Garnet.....	Van Rensselaer Collection.
600 Garnet.....	Van Rensselaer Collection.
601 Garnet .....	Schoharie, N. Y.
602 Garnet in gneiss .....	Yonkers, Westchester Co., N. Y.
603 Garnet.....	New Hampshire.
604 Garnet .....	Van Rensselaer Collection.
605 Garnet in Talcose slate.....	Dover, Dutchess Co., N. Y.
606 Garnets in Mica slate.....	
607 Garnet in Labradorite.....	Lewis Corners, Essex Co.
608 Garnet in Hornblende.....	

## Number.

- 609 Garnet (Melanite).....  
 610 Garnet (Melanite).....Franklin, N. J.  
 611 Garnet:.....Franklin, N. J.  
 612 Garnet:.....Hanover N. H.  
 613 Garnet .....  
 614 Garnet (Cinnamon stone) .....Amity, Orange Co., N. Y. 599  
       Beck Collection.  
 615 Garnet (Colophonite).....Willsborough, Essex Co., N. Y.  
 616 Garnet.....  
       Van Rensselaer Collection.  
 617 Garnet (Colophonite) .....Willsborough, Essex Co., N. Y.  
 618 Garnet (Colophonite).....  
       Van Rensselaer Collection.  
 619 Garnet (Colophonite).....  
       Van Rensselaer Collection.  
 620 Zircon .....Cornwall, Orange Co., N. Y.  
 621 Zircon.....  
 622 Zircon in Scapolite.....Edenville, Orange Co., N. Y.  
 623 ?.....  
 624 Zircon .....Warwick, Orange Co., N. Y.  
 625 Vesuvianite.....Sandford mine, Essex Co., N. Y.  
       Pickett Collection.  
 626 Vesuvianite.....Vesuvius, Italy.  
       Gebhard Collection.  
 627 Vesuvianite.....Vesuvius ? Italy.  
       Gebhard Collection.  
 628 Vesuvianite .....  
 629 Vesuvianite in lava ?.....Vesuvius ? Italy.  
 630 Vesuvianite .....Vesuvius ? Italy.  
 631 Vesuvianite .....Vesuvius ? Italy.  
 632 Vesuvianite .....Vesuvius ? Italy.  
 633 Vesuvianite (Egeran).....Eger, Bohemia.  
 634 Epidote.....Norway.  
 635 Epidote.....Norway.  
       Gebhard Collection. \*  
 636 Epidote.....Warwick, Mass.  
       Pickett Collection.  
 637 Epidote.....Harlem, N. Y.  
       Beck Collection.  
 638 Epidote.....  
       Pickett Collection.  
 639 Epidote.....Chester.  
       Gebhard Collection.  
 640 Epidote and garnet.....  
 641 Zoisite .....Newfane, Vt.  
 642 Zoisite.....  
       Gebhard Collection.  
 643 Axinite.....Cornwall, Eng.  
 644 Lepidolite.....Paris, Me.  
       Pickett Collection.  
 645 Lepidolite.....  
       Van Rensselaer Collection.



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- 646 Margarodite ..... Acworth, N. H.  
 647 Margarodite ..... Trumbull, Conn.  
     Simms Collection.  
 648 Margarodite ..... Acworth, N. H.  
 649 Mica ..... Yonkers, Westchester Co., N. Y. 497  
     Beck Collection.  
 650 Muscovite ..... Moriah, Essex Co., N. Y.  
 651 Mica in granite ..... Central Park, N. Y.  
 652 Mica (muscovite) .....  
 653 Mica (muscovite) .....  
 654 Mica (phlogopite) .....  
     Pickett Collection.  
 655 Phlogopite ..... Perth, Canada.  
 656 Phlogopite ..... Perth, Canada.  
 657 Phlogopite ..... Edenville, Orange Co., N. Y.  
 658 Phlogopite ..... Edenville, Orange Co., N. Y.  
 659 Phlogopite ..... Edenville, Orange Co., N. Y.  
 660 Phlogopite ..... Monroe, Orange Co., N. Y.  
 661 Mica ..... St. Lawrence Co., N. Y.  
 662 Mica ..... Rossie, St. Lawrence Co., N. Y.  
 663 Mica ..... Antwerp, Jefferson Co., N. Y.  
 664 Phlogopite ..... Edwards, St. Lawrence Co., N. Y.  
 665 Phlogopite ..... Edwards, St. Lawrence Co., N. Y.  
 666 Phlogopite ..... Pope's Mills, St. Lawrence Co., N. Y.  
 667 Biotite in quartz,  
     Quartz quarry, Crown Point, Essex Co., N. Y.  
 668 Mica (Biotite) .....  
 669 Scapolite .....  
 670 Scapolite ..... Cheever mine, Essex Co., N. Y.  
 671 Scapolite ..... Amity, Orange Co., N. Y.  
 672 Scapolite ..... Edenville, Orange Co., N. Y.  
 673 Scapolite .....  
     Van Rensselaer Collection.  
 674 Scapolite ..... Lewis, Essex Co., N. Y.  
 675 Scapolite ..... Ticonderoga, Essex Co., N. Y.  
     Beck Collection.  
 676 Scapolite ..... Keene, Essex Co., N. Y.  
     Gebhard Collection.  
 677 Scapolite .....  
 678 Scapolite ..... St. Lawrence Co., N. Y.  
 679 Scapolite .....  
 680 Scapolite ..... Massachusetts.  
     Pickett Collection.  
 681 Meionite and Natrolite in lava ..... Mt. Somma, Italy.  
 682 Hauynite in lava ..... Mt. Vesuvius, Italy.  
 683 Hauynite ..... Andernach, Lake Laach, Rhine, Germany.  
 684 Hauynite in glassy feldspar,  
     Andernach, Lake Laach, Rhine, Germany.  
 685 Leucite in lava ..... Vesuvius, Italy.  
 686 Leucite ..... Vesuvius, Italy.  
 687 Labradorite ..... Essex Co., N. Y.

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688	Labradorite.....	Essex Co., N. Y.	1076
	Beck Collection.		
689	Labradorite.....		
	Gebhard Collection.		
690	Labradorite.....		
691	Labradorite.....	St. Lawrence Co.	
692	Albite and Schörl.....	East Haddam, Conn.	
693	Albite .....		
694	Feldspar .....		
	Van Rensselaer Collection.		
695	Albite and Rubellite.....	Massachusetts.	
696	Albite and Rubellite.....	Massachusetts.	
697	Albite.....	Crown Point, Essex Co.	
698	Albite .....		
699	Albite and Tourmaline.....	Haddam, Conn.	346
	Simms Collection.		
700	Sanidin in trachyte .....	Rhine, Germany.	
701	Sanidin in trachyte .....	Rhine, Germany.	
702	Oligoclase in trachyte.....		
703	Andesite.....		
704	Adularia .....	Tyrol.	
705	Adularia.....	Tyrol.	
706	Andesite in trachyte....		
707	Amazonstone .....	Siberia.	
708	Amazonstone .....	Colorado.	
	From W. H. Strahan.		
709	Feldspar .....	New York Island.	
	Beck Collection.		
710	Feldspar .....		
711	Orthoclase in granite .....		
712	Orthoclase and Quartz.....	New York Island.	
713	Feldspar, red.....	Harlem, N. Y.	
714	Orthoclase in granite .....		
715	Orthoclase in granite .....		
716	Orthoclase .....	Moriah, Essex Co., N. Y.	
717	Feldspar .....	Rossie, St. Lawrence Co., N. Y.	212
	Beck Collection.		
718	Orthoclase and Albite .....	Brown Point.	
	Simms Collection.		
719	Feldspar (Pelunze).....	Nictervy, Rio de Janeiro.	
	Brazil Collection.		
720	Orthoclase .....		
721	Orthoclase .....		
722	Feldspar, red.....	Ticonderoga, Essex Co., N. Y.	556
	Beck Collection.		
723	Feldspar.....	Connecticut.	
	Pickett Collection.		
724	Feldspar.....	Little Falls, Herkimer Co.	437
	Beck Collection.		
725	Oligoclase and Blue Quartz .....	Bucks Co., Pa.	
	From Prof. Leeds.		

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- 726 Oligoclase ..... Westchester, Pa.  
From Prof. Leeds.
- 727 Feldspar.....  
Van Rensselaer Collection.
- 728 Orthoclase.....  
Gebhard Collection.
- 729 Feldspar ..... Essex Co., N. Y.  
Pickett Collection.
- 730 Chondrodite, Magnetite and Calcite,  
Schroon, Essex Co., N. Y.
- 731 Chondrodite and Spinel.....  
Beck Collection.
- 732 Chondrodite and Spinel.. Natural Bridge, Orange Co., N. Y. 395  
Beck Collection.
- 733 Chondrodite..... Amity, Orange Co., N. Y.
- 734 Chondrodite, Calcite and Graphite,  
Edenville, Orange Co., N. Y.
- 735 Tourmaline.....
- 736 Tourmaline (brown)... Gouverneur, St. Lawrence Co., N. Y.
- 737 Tourmaline ..... De Kalb, St. Lawrence Co., N. Y.
- 738 Mesolite (?)..... Bergen Hill, N. J.
- 739 Tourmaline..... De Kalb, St. Lawrence Co., N. Y.
- 740 Tourmaline.....
- 741 Tourmaline.....
- 742 Tourmaline.....  
Van Rensselaer Collection.
- 743 Tourmaline.....
- 744 Tourmaline.....
- 745 Tourmaline.....  
Van Rensselaer Collection.
- 746 Tourmaline ..... Monroe, Conn.
- 747 Tourmaline.....
- 748 Tourmaline (black) .....  
Van Rensselaer Collection.
- 749 Tourmaline in Quartz ..... Chester, Mass.
- 750 Tourmaline.....  
Van Rensselaer Collection.
- 751 Tourmaline ..... 300  
Simms Collection.
- 752 Tourmaline..... Warwick, Orange Co., N. Y. 580  
Beck Collection.
- 753 Tourmaline ..... Port Henry, Essex Co., N. Y.  
Pickett Collection
- 754 Tourmaline (brown).....  
Van Rensselaer Collection.
- 755 Tourmaline (brown).....  
Van Rensselaer Collection.
- 756 Tourmaline (blue)..... Massachusetts.
- 757 Tourmaline (green).....
- 758 Tourmaline (Rubellite) in Albite .....  
Van Rensselaer Collection.

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- 759 Tourmaline (Rubellite) in Albite.....Chesterfield, Mass.  
Pickett Collection.
- 760 Andalusite .....  
Van Rensselaer Collection.
- 761 Andalusite .....Lancaster.
- 762 Andalusite .....Massachusetts.  
Pickett Collection.
- 763 Andalusite .....Lancaster, Mass.?  
Gebhard Collection.
- 764 Fibrolite (Monrolite) .....Monroe, Orange Co., N. Y.  
Beck Collection.
- 765 Cyanite.....Goshen, Mass.
- 766 Cyanite.....  
Gebhard Collection.
- 767 Cyanite in coarse granite.....
- 768 Cyanite and Quartz.....New England.
- 769 Cyanite and Quartz.....Chesterfield, Mass.
- 770 Cyanite.....
- 771 Cyanite (Disthene) in quartz.....Missoens, S. Pedro de Sul.  
Brazilian Collection.
- 772 Cyanite.....  
Van Rensselaer Collection.
- 773 Topaz .....Trumbull, Conn.  
Simms Collection.
- 774 Topaz .....
- 775 Topaz .....Trumbull, Conn.  
Simms Collection.
- 776 Topaz (green) and Fluorspar .....Trumbull, Conn.  
Gebhard Collection.
- 777 Topaz (Brazilian) .....Brazil.  
From Hon. A. T. Johnson.
- 778 Topaz (Brazilian) .....Brazil.  
From Hon. A. T. Johnson.
- 779 Topaz .....P. de Minas.  
Brazilian Collection.
- 780 Datolite .....Bergen Hill, N. J.
- 781 Datolite.....Bergen Tunnel, N. J.  
From Prof. Leeds.
- 782 Datolite.....Bergen Hill, N. J.
- 783 Titanite .....Lewis, St. Lawrence Co.? N. Y.
- 784 Titanite (Sphene)...Phillips' iron mine, Putnam Co., N. Y.
- 785 Titanite (Sphene)...Phillips' iron mine, Putnam Co., N. Y.
- 786 Titanite (Sphene)...Bush's mine, Cornwall, Orange Co., N. Y.
- 787 Staurolite in Hornblende Slate.....
- 788 Staurolite ..... 329  
Gebhard Collection.
- 789 Staurolite .....Vermont.
- 790 Staurolite and Garnet.....New York.
- 791 Staurolite in mica Slate.....
- 792 Staurolite .....  
Van Rensselaer Collection.



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793 }	Pectolite.....	Bergen Tunnel, N. J.
794 }		
	From Prof. Leeds.	
795	Pectolite.....	Bergen Hill, N. J. 261
	Simms Collection.	
796	Pectolite.....	Bergen Hill, N. J.
797	Laumonite .....	Cold Spring? Putnam Co., N. Y.
798	Laumonite .....	Gebhard Collection.
799	Chrysocolla.....	
800	Calamine.....	Franklin, N. J.
	From Prof. Leeds.	
801	Prehnite.....	Paterson, N. J.
802	Prehnite.....	Van Rensselaer Collection.
803	Prehnite.....	Van Rensselaer Collection.
804	Prehnite.....	Gebhard Collection.
805	Prehnite.....	Gebhard Collection.
806	Prehnite.....	Bellows Falls, Vt.
	Pickett Collection.	
807	Prehnite.....	Van Rensselaer Collection.
808	Apophyllite .....	
809	Apophyllite .....	Staten Island, N. Y.
810	Apophyllite .....	
811	Apophyllite .....	Bergen, N. J.
	Pickett Collection.	
812	Allophane.....	Silesia, Ger.
813	Thomsonite.....	Peter's Pt., N. S.
814	Natrolite in phonolite .....	Germany.
815	Natrolite in phonolite .....	Germany.
816	Natrolite.....	Bergen Tunnel, N. J.
	From Prof. Leeds.	
817	Natrolite.....	Van Rensselaer Collection.
818	Chabazite and Stilbite.....	
819	Chabazite .....	Van Rensselaer Collection.
820	Chabazite.....	Germany.
821	Chabazite.....	Chester, Mass.?
822	Chabazite.....	Nova Scotia.
823	Phillipsite (in lava).....	Vesuvius, Italy.
824	Thomsonite in lava .....	Mt. Somma, Italy.
825	Chabasite and Heulandite .....	Nova Scotia.
826	Stilbite.....	Kilmalcolm, Scot.
827	Stilbite.....	
828	Analcite.....	Aussig, Bohemia.
829	Analcite .....	Van Rensselaer Collection.

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830	Analcite in malachite, with native copper.....	
831	Analcite .....	
	Van Rensselaer Collection.	
832	Analcite .....	
	Van Rensselaer Collection.	
833	Analcite .....	Nova Scotia.
834	Analcite .....	
	Van Rensselaer Collection.	
835	Analcite .....	
	Van Rensselaer Collection.	
836	Sepiolite (Meerschauum) .....	
	Pickett Collection.	
837	Talc.....	North Troy, Vt.
838	Talc.....	England.
839	Talc.....	Smithfield, R. I.
	Pickett Collection.	
840	Talc.....	Connecticut.
841	Talc with Staurolite....	
842	Talc (foliated).....	Bridgewater, Vt.
	Simms Collection.	78
843	Steatite.....	Newfane, Vt.
844	Talc, Fluorite, etc.....	Amity, Orange Co., N. Y.
	Beck Collection.	646
845	Talc.....	Fitchburg, Mass.
	Pickett Collection.	
846	Talc .....	
	Pickett Collection.	
847	Talc and Fluorspar .....	Amity, Orange Co., N. Y.
848	Talc.....	
	Van Rensselaer Collection.	
849	Talc.....	Middlefield, Mass.
850	Talc.....	
	Gebhard Collection.	
851	Steatite.....	Jefferson Co., N. Y.
852	Steatite.....	Grafton, Vt.
853	Steatite.....	
854	Serpentine (precious).....	Newburyport, Mass.
855	Serpentine with Chrysotile .....	Newburyport, Mass.
856	Serpentine (precious).....	Massachusetts.
857	Serpentine (precious).....	Piedmont, Italy.
858	Serpentine .....	
	Gebhard Collection.	
859	Serpentine.....	Phillipstown, Putnam Co.
	Beck Collection.	
860	Serpentine .....	Amity, Orange Co., N. Y.
861	Serpentine and Calcite.....	Port Henry, Essex Co., N. Y.
862	Serpentine .....	New Rochelle, Westchester Co., N. Y.
863	Serpentine.....	New Rochelle, Westchester Co., N. Y.
864	Serpentine .....	Mexico.
865	Serpentine .....	Fort Ann, Washington Co., N. Y.
866	Serpentine (brown).....	Middlefield, Mass.
867	Serpentine (Marmolite).....	Hoboken, N. J.

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868	Serpentine (Marmolite).....	Hoboken, N. J.	
869	Serpentine (Marmolite).....	Hoboken, N. J.	
870	Serpentine (Marmolite).....		
871	Marmolite.....	Staten Island, N. Y.	
872	Serpentine (Marmolite).....	Staten Island, N. Y.	
873	Serpentine (Marmolite).....	Hoboken, N. J.	
874	Mamolite and Serpentine .....		
875	Serpentine and Chrysotile..	Phillipstown? Putnam Co., N. Y.	
876	Cerolite.....	Stony Pt., Rockland Co., N. Y.	18
	Beck Collection.		
877	Kaolinite .....		
878	Kaolinite .....		
879	Kaolinite .....		
880	Kaolinite .....		95
	Brazilian Collection.		
881	Kaolinite .....		
882	Clay (refractory).....	Belim, P. de Posa.	99
	Brazilian Collection.		
883	Kaolin.....	Thesfureiro, P. de Minas.	97
	Brazilian Collection.		
884	(Argillaceous) schist.....		
	Brazilian Collection.		
885	Clay (siliceous) .....		98
	Brazilian Collection.		
886	Schistose slate.....		
	Brazilian Collection.		
887	Vermiculite .....	Conshohocken, Pa.	
	From Prof. Leeds.		
888	Iolite .....	Haddam, Conn.	
	Pickett Collection.		
889	Iolite.....	Haddam, Conn.	
890	Microlite.....	Chesterfield, Mass.	
891	Clintonite .....	Amity, Orange Co., N. Y.	
	Simms Collection.		
892	Clintonite.....	Amity, Orange Co., N. Y.	
893	Pimelite.....	Silesia.	
894	Pimelite.....	Silesia.	
895	Jefferisite.....	near Westchester, Pa.	
	From Prof. Leeds.		
896	Chlorite, with magnetite.....		
	Gebhard Collection.		
897	Clinocllore.....	near Westchester, Pa.	
	From Prof. Leeds.		
898	Apatite.....		
	Pickett Collection.		
899	Apatite.....		
	Gebhard Collection.		
900	Apatite.....		
901	Apatite.....		
	Pickett Collection.		
902	Apatite .....		

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- 903 Apatite .....  
Van Rensselaer Collection.
- 904 Apatite ..... Crown Point, Essex Co., N. Y.
- 905 Apatite on galenite .....  
From Dr. Crary, Albany.
- 906 Apatite ..... Edenville, Orange Co., N. Y.
- 907 Apatite (Eupyrchroite) ..... Crown Point, Essex Co., N. Y.
- 908 Torbernite ..... Europe.
- 909 Pyromorphite ..... Germany?  
Van Rensselaer Collection.
- 910 Pyromorphite and mimetite ..... Cumberland, Eng.  
(Coldbeck Fells.)
- 911 Pyromorphite .....  
Van Rensselaer Collection.
- 912 Vivianite ..... Mendham, N. J.?  
Gebhard Collection.
- 913 Vivianite ..... Mendham, N. J.?
- 914 Wavellite .....  
Van Rensselaer Collection.
- 915 Wavellite .....  
Van Rensselaer Collection.
- 916 Wavellite .....  
Van Rensselaer Collection.
- 917 Wavellite ..... Rochester, N. Y.
- 918 Wavellite ..... Steamboat, Pa.
- 919 Erythrite .....
- 920 Erythrite .....
- 921 Erythrite (cobalt bloom), Antonio Pereira, P. de Minas, Brazil. 92  
Brazilian Collection.
- 922 Soda nitre ..... Peru.  
From Miss E. Fischer.
- 923 Borax ..... Borax lake, California.
- 924 Warwickite ..... Edenville, Orange Co., N. Y.
- 925 Volborthite .....
- 926 Alum slate ..... Hoosick, N. Y.
- 927 Barite ..... Max Point? Jefferson Co.
- 928 Barite and Strontianite ..... Schoharie, N. Y.
- 929 Barite .....  
Pickett Collection.
- 930 Barite ..... Little Falls, Herkimer Co., N. Y.
- 931 Barite ..... St. Lawrence Co., N. Y.
- 932 Barite ..... Devonshire, Eng.
- 933 Barite ..... Watertown, Jefferson Co., N. Y. 74  
Simms Collection.
- 934 Barite .....  
Van Rensselaer Collection.
- 935 Barite (in Septarium) ..... Middleburg, Schoharie Co., N. Y.
- 936 Barite ..... Cacapava, P. S. Pedro do Sul.  
Brazilian Collection.
- 937 Barite ..... Gouverneur, St. Lawrence Co., N. Y.
- 938 Barite .....  
Van Rensselaer Collection.



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939 Barite	Pickett Collection.
940 Barite and Fluorite	Van Rensselaer Collection.
941 Barite and Calcite	Van Rensselaer Collection.
942 Barite	Van Rensselaer Collection.
943 Barite	Cheshire, Conn. From H. S. Peck.
944 Barite	N. New York. Pickett Collection.
945 Barite	Gebhard Collection.
946 Barite	Schoharie, Schoharie Co., N. Y.
947 Barite	
948 Barite	Gouverneur, St. Lawrence Co., N. Y.
949 Barite	Van Rensselaer Collection.
950 Barite	Van Rensselaer Collection.
951 Barite	
952 Barite	De Kalb, St. Lawrence Co., N. Y.
953 Barite	
954 Barite	
955 Barite	Van Rensselaer Collection.
956 Barite	Carlisle, Schoharie Co., N. Y. Simms Collection.
957 Barite	Pillar Point, Jefferson Co., N. Y.
958 Barite	Van Rensselaer Collection.
959 Celestite	Stark, Herkimer Co., N. Y. 1137 Beck Collection.
960 Celestite	Beck Collection.
961 Celestite	Syracuse, Onondaga Co., N. Y. Beck Collection.
962 Celestite	Syracuse, Onondaga Co., N. Y.
963 Celestite	
964 Celestite	Tyrone, Pa. From Prof. Leeds.
965 Anglesite, Cerussite and Galenite,	Village l'Orient, Island St. Baits.
966 Crocoite	Van Rensselaer Collection.
967 Crocoite	Van Rensselaer Collection.
968 Crocoite	Van Rensselaer Collection.
969 Crocoite	Van Rensselaer Collection.

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970 Crocoite .....	Van Rensselaer Collection.
971 Crocoite .....	Van Rensselaer Collection.
972 Crocoite .....	Van Rensselaer Collection.
973 Crocoite .....	Van Rensselaer Collection.
974 Crocoite .....	Gebhard Collection.
975 Crocoite (chromate of lead) .....	Goyabira, P. de Minas. Brazilian Collection.
976 Gypsum .....	Grand Rapids, Mich. From C. K. Williams, Vermont.
977 Gypsum (fibrous) .....	Ega, P. d'Amazona. Brazilian Collection.
978 Gypsum .....	
979 Gypsum .....	
980 Gypsum .....	
981 Gypsum .....	Grand Rapids, Mich. From J. Ball, Kent county.
982 Gypsum (fibrous) .....	Van Rensselaer Collection.
983 Gypsum (fibrous) .....	Van Rensselaer Collection.
984 Gypsum .....	
985 Gypsum .....	
986 Gypsum .....	Scottsville, Monroe Co., N. Y. Pickett Collection.
987 Gypsum .....	Grand Rapids, Mich. Pickett Collection.
988 Gypsum .....	
989 Gypsum .....	Lockport, Niagara Co., N. Y.
990 Gypsum .....	Grand Rapids, Mich. Pickett Collection.
991 Gypsum .....	Van Rensselaer Collection.
992 Gypsum .....	Grand Rapids.
993 Gypsum .....	Paris, France.
994 Gypsum .....	Grand Rapids, Mich.
995 Gypsum .....	Paris, France.
996 Gypsum .....	Grand Rapids.
997 Gypsum (fibrous) .....	D'Alcantara, P. Maranhao. Brazilian Collection.
998 Gypsum .....	Lockport, Niagara Co., N. Y. Pickett Collection.
999 Gypsum (fibrous) .....	Van Rensselaer Collection.
1000 Gypsum .....	Alabaster Bay, Mich.
1001 Alum .....	
1002 Gypsum ? .....	

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1003	Gypsum .....	Auburn, Cayuga Co., N. Y. From Fred. Starr, Auburn.
1004	Gypsum .....	Do Appody, P. de Rio Grande del Norte. 25 Brazilian Collection.
1005	Gypsum (water worn) .....	Onondaga Co., N. Y.
1006	Gypsum .....	De Belmonte, P. de Ceara. 19 Brazilian Collection.
1007	Gypsum .....	Grand Rapids, Mich. From C K. Williams.
1008	Gypsum .....	
1009	Gypsum .....	Ellsworth. Gebhard Collection.
1010	Gypsum .....	Ellsworth. From Dr. Crary.
1011	Gypsum .....	Gebhard Collection.
1012	Gypsum .....	Van Rensselaer Collection.
1013	Gypsum .....	Ellsworth. Gebhard Collection.
1014	Gypsum .....	Scottville, Monroe Co., N. Y.
1015	Calcite .....	
1016	Calcite .....	Rossie, St. Lawrence Co., N. Y.
1017	Calcite .....	Ox Bow, Jefferson Co., N. Y.
1018	Calcite .....	Ox Bow, Jefferson Co., N. Y.
1019	Calcite .....	Ox Bow, Jefferson Co., N. Y.
1020	Calcite .....	Ox Bow, Jefferson Co., N. Y.
1021	Calcite .....	Port Henry, Essex Co., N. Y.
1022	Calcite .....	Port Henry, Essex Co., N. Y.
1023	Calcite and pyrite .....	Rossie, St. Lawrence Co., N. Y.
1024	Calcite .....	Europe.
1025	Calcite .....	
1026	Calcite .....	Bergen Tunnel, N. J. From Prof. Leeds.
1027	Calcite, dolomite, etc.,	Spraker's Basin, Montgomery Co., N. Y.
1028	Calcite .....	
1029	Calcite (red) .....	Cornwall, Orange Co., N. Y. 293 Beck Collection.
1030	Calcite .....	Van Rensselaer Collection.
1031	Calcite .....	Port Henry, Essex Co., N. Y.
1032	Calcite, with indurated Bitumen in dolomite,	Flat Creek, Montgomery Co., N. Y.
1033	Calcite .....	Van Rensselaer Collection.
1034	Calcite (Dog-tooth Spar) .....	Lockport, Niagara Co., N. Y.
1035	Calcite .....	Rossie, St. Lawrence Co., N. Y. 301 Beck Collection.
1036	Calcite .....	Lockport, Niagara Co., N. Y. Simms Collection.

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- 1037 Calcite ..... Gebhard Collection.
- 1038 Calcite ..... Rossie, St. Lawrence Co., N. Y.
- 1039 Calcite .....
- 1040 Calcite .....
- 1041 Calcite ..... Ox Bow, Jefferson Co., N. Y.
- 1042 Calcite ..... Schoharie, N. Y.
- 1043 Calcite and quartz ..... Burlington, Iowa.  
Pickett Collection.
- 1044 Calcite ..... Rossie, St. Lawrence Co., N. Y.
- 1045 Calcite and graphite ..... Ticonderoga, Essex Co., N. Y.
- 1046 Calcite .....  
Van Rensselaer Collection.
- 1047 Calcite .....
- 1048 Calcite ..... Grand Rapids, Mich.  
Pickett Collection.
- 1049 Calcite .....
- 1050 Calcite .....
- 1051 Calcite .....  
Van Rensselaer Collection.
- 1052 Calcite (Hudson River Group) ..... N. Y.  
From J. McArdle, Albany.
- 1053 Calcite ..... Middleville, Herkimer Co., N. Y.
- 1054 Calcite .....
- 1055 Calcite ..... Rossie, St. Lawrence Co., N. Y.
- 1056 Calcite .....  
Van Rensselaer Collection.
- 1057 Calcite .....  
Van Rensselaer Collection.
- 1058 Calcite .....  
Van Rensselaer Collection.
- 1059 Calcite and quartz .....  
Van Rensselaer Collection.
- 1060 Calcite .....  
Simms Collection. ?
- 1061 Calcite ..... Grand Rapids, Mich.  
Pickett Collection.
- 1062 Calcareous tufa ... Boiling Spring, Humboldt Co., Nevada.  
From G. W. Pine, Herkimer.
- 1063 Calcite .....  
Gebhard Collection.
- 1064 Calcite coated with hyd. oxide of iron,  
Mineville, Essex Co., N. Y.
- 1065 Stalagmite ..... Ball's Cave, Schoharie Co., N. Y.
- 1066 Limerock ..... Bethlehem, Palestine.
- 1067 Calcite .....  
Van Rensselaer Collection.
- 1068 Stalactite .....
- 1069 } Stalactite ..... Todd's Cave, Ky. 239
- 1070 }  
Simms Collection.



- Number.
- 1071 Stalagmite.....Howe's Cave, Schoharie Co., N. Y.
- 1072 Stalagmite.....Ball's Cave, Schoharie Co., N. Y.
- 1073 Stalagmite.....Ball's Cave, Schoharie Co., N. Y.
- 1074 Stalactite.....Ball's Cave, Schoharie Co., N. Y.
- 1075 Stalagmite and arragonite,  
Gebhard's Cave, Schoharie Co., N. Y.
- 1076 Stalactite.....Todd's Cave, Kentucky. 239  
Simms Collection.
- 1077 Stalagmite (polished) ....Ball's Cave, Schoharie Co., N. Y.
- 1078 Stalagmite.....
- 1079 Stalactite.....Howe's Cave, Schoharie Co., N. Y.
- 1080 Calcite (geode).....  
Pickett Collection.
- 1081 Calcite .....  
Van Rensselaer Collection.
- 1082 Calcite .....
- 1083 Calcite .....
- 1084 Calcite and Quartz.....  
Van Rensselaer Collection.
- 1085 Calcite and Galenite.....Rossie, St. Lawrence Co., N. Y.
- 1086 Calcite .....
- 1087 Calcite .....
- 1088 Calcite .....
- 1089 Calcite .....
- 1090 Calcite .....
- 1091 Calcite and Quartz.....  
Van Rensselaer Collection.
- 1092 Calcite and Quartz.....  
Van Rensselaer Collection.
- 1093 Calcite .....Ox Bow, Jefferson Co., N. Y.
- 1094 Calcite.....Jefferson Co., N. Y.
- 1095 Calcite.....Parish ore bed, St. Lawrence Co., N. Y.
- 1096 Calcite .....Rossie, St. Lawrence Co., N. Y.
- 1097 Calcite (Dogtooth and Pearl Spar) .....Lockport, N. Y.
- 1098 Calcite (Dogtooth Spar)....Lockport, Niagara Co., N. Y.
- 1099 Calcite (Dogtooth Spar)....Lockport, Niagara Co., N. Y.
- 1100 Calcite .....Rossie, St. Lawrence Co., N. Y.
- 1101 Calcite (Dogtooth and Pearl Spar),  
Lockport, Niagara Co., N. Y.
- 1102 Calcite.....Ox Bow, Jefferson Co., N. Y.
- 1103 Calcite .....Middleburg, Schoharie Co., N. Y.
- 1104 Calcite.....Jefferson Co., N. Y.
- 1105 Fontainebleau Limestone.....  
Van Rensselaer Collection.
- 1106 Fontainebleau Limestone.....  
Van Rensselaer Collection.
- 1107 Fontainebleau Limestone.....  
Van Rensselaer Collection.
- 1108 Fontainebleau Limestone.....  
Van Rensselaer Collection.
- 1109 Calcite .....

## Number.

- 1110 Calcite, blue ..... Diana, Lewis Co., N. Y.  
 1111 Calcite ..... Diana, Lewis Co., N. Y.  
 1112 Calcite ..... St. Augustine, Fla.  
 1113 Calcite ..... Monroe, Orange Co., N. Y.  
 1114 Calcareous Schist ..... Batunte, P. de Ceara.  
     Brazilian Collection.  
 1115 Marble (Italian, white) ..... Italy.  
     From Capitol, Washington.  
 1116 Marble (white) ..... Plains of Marathon, Greece.  
 1117 Marble (Lamellar, white) ..... Texas.  
     Pat. Office, Washington.  
 1118 Marble (Crystalline, white) .... Post-office, Baltimore, Md.  
 1119 Marble ..... Massachusetts.  
 1120 Marble ..... De Campos, P. de Rio de Janeiro.  
     Brazilian Collection.  
 1121 Marble (Tenn.) ..... Hawkins Co., Tenn.  
 1122 Marble (Calico) ..... Montpelier, Vt.  
 1123 Marble (Breccia) ..... Pyrenees, Spain.  
     Pickett Collection.  
 \* 1124 Marble (Coralline) ..... Bavarian Alps, Europe.  
     Pickett Collection.  
 1125 Marble (Statuary) ..... Middlebury, Vt.  
     Pickett Collection.  
 1126 Marble (Variegated, Italian) ..... Italy.  
     Simms Collection.  
 1127 Marble (Italian Dove) .....  
 1128 Marble ..... Italy?  
 1129 Marble (Egyptian) .....  
     Pickett Collection.  
 1130 Marble .....  
     Gebhard Collection.  
 1131 Limestone, (black) polished .....  
 1132 Marble (white) with Talc .....  
 1133 Marble (white) ..... N. Lee, Mass.  
 1134 Marble (Dove) ..... Swanton, Vt.  
     Gebhard Collection.  
 1135 Marble, black ..... Isle La Motte, Vt.  
 1136 Marble, Lower limestone, perhaps Trenton .....  
 1137 Marble, black ..... Galway, Ireland.  
     Gebhard Collection.  
 1138 Marble, black .....  
 1139 Marble, gray .....  
 1140 Marble, black .....  
 1141 Marble, birdseye ..... Kingston.  
 1142 Marble ..... Lisbon, Portugal.  
     Pickett Collection.  
 1143 Marble, white .....  
 1144 Marble, Coralline ..... Bavarian Alps.  
     Pickett Collection.  
 1145 Marble, white ..... Stockbridge, Mass.  
 1146 Marble, striped .....

## Number.

- 1147 Marble, "Italian Bardilla" .....
- 1148 Marble, encrinal.....West Camp, Ulster Co., N. Y.  
From J. H. Gould.
- 1149 Marble .....  
Pickett Collection.
- 1150 Marble .....Columbia Co., N. Y.
- 1151 Marble, encrinal .....Ashland, Devonshire, Eng.  
Pickett Collection.
- 1152 Marble, Shell.....Derbyshire, Eng.  
Pickett Collection.
- 1153 Limestone, Black River.....
- 1154 Marble, Egyptian .....  
Gebhard Collection.
- 1155 Marble, Variegated .....Devonshire, Eng.  
Pickett Collection.
- 1156 Marble, Concretionary.....Derbyshire, Eng.  
Pickett Collection.
- 1157 Limestone, Fibrous.....England.
- 1158 Marl.....Copenhagen, Lewis Co., N. Y.
- 1159 Marl.....Apulia, Onondaga Co., N. Y.
- 1160 Marl.....Claverack, Columbia Co., N. Y.
- 1161 Marl, Calcareous.....Fort Ann, Washington Co., N. Y.
- 1162 Marl .....Syracuse, Onondaga Co., N. Y.1114  
Beck Collection.
- 1163 Limestone, Concreted.....Rochester, N. Y.  
Pickett Collection.
- 1164 Limestone, Hydraulic,  
Van Epps Quarry, Amsterdam, Montgomery Co., N. Y. 425  
Beck Collection.
- 1165 Limestone, Hydraulic...Manlius, Onondaga Co., N. Y.
- 1166 Limestone, Hydraulic.....De Bacauga, P. de Maranhao.  
Brazilian Collection.
- 1167 Limestone.....S. Jo d'Ypanama, P. de S. Paulo. 24  
Brazilian Collection.
- 1168 Limestone.....Vassabarriz, P. de Sergipe. 23  
Brazilian Collection.
- 1169 Limestone Marble.....Itabira de Campo, P. de Minas. 109  
Brazilian Collection.
- 1170 Limestone, Hydraulic.....De Chepada, P. de Maranhao. 14  
Brazilian Collection.
- 1171 Limestone, Saccharoidal.....Terra des Asperesas. 15  
Brazilian Collection.
- 1172 Limestone.....Maijeus de Rio de Francisco do Norte. 17  
Brazilian Collection.
- 1173 Marble, Egyptian .....
- 1174 Septarium .....
- 1175 Limestone .....Camravieiras, P. de Bahia.  
Brazilian Collection.
- 1176 Sea Shells cemented by Silica ("Coquina stone")..Florida.
- 1177 Marble, variegated...Pleasant Valley, Dutchess Co., N. Y.
- 1178 Marble, variegated .....

Number.		
1179	Stalagmite.....	Ball's Cave, Schoharie Co., N. Y.
1180	Stalagmite.....	Ball's Cave, Schoharie Co., N. Y.
1181	Stalagmite.....	Ball's Cave, Schoharie Co., N. Y.
1182	Stalagmite.....	Ball's Cave, Schoharie Co., N. Y.
1183	Stalactite.....	Ball's Cave, Schoharie Co., N. Y.
1184	Calcareous Tufa . . .	Sharon Springs, Schoharie Co., N. Y. 173 Simms Collection.
1185	Calcareous Tufa.....	Schoharie, Schoharie Co., N. Y. 26 Simms Collection.
1186	Calcareous Tufa . . .	Van Hornesville, Herkimer Co., N. Y.
1187	Stalactite.....	Gruta de Inferno, P. de Matte Grosso.
1188	Calcareous Tufa . . . . .	Jamesville, Onondaga Co., N. Y.
1189	Calcareous Tufa.....	Litchfield, Herkimer Co., N. Y. 110 Simms Collection.
1190	Shells cemented ("Coquina stone").....	Jacksonville, Fla.
1191	Lime rock.....	Bethlehem, Palestine. 52
1192	"Coquina stone".....	St. Augustine, Fla.
1193	Dolomite (Pearl Spar).....	Lockport, Niagara Co., N. Y.
1194	Dolomite (Pearl Spar).....	Lockport, Niagara Co., N. Y.
1195	Dolomite (Pearl Spar).....	Lockport, Niagara Co., N. Y.
1196	Dolomite (Pearl Spar).....	Lockport, Niagara Co., N. Y.
1197	Dolomite (Pearl Spar).....	Lockport, Niagara Co., N. Y.
1198	Dolomite (Pearl Spar).....	Lockport, Niagara Co., N. Y.
1199	Dolomite (Pearl Spar).....	Rossie, St. Lawrence Co., N. Y.
1200	Dolomite (Pearl Spar).....	Lockport, Niagara Co., N. Y.
1201	Dolomite (Pearl Spar).....	Lockport, Niagara Co., N. Y.
1202	Dolomite (Pearl Spar).....	Lockport, Niagara Co., N. Y.
1203	Dolomite....	Honeoye Falls, St. Lawrence Co., N. Y.
1204	Dolomite.....	
1205	Dolomite.....	Cumington, Mass. Pickett Collection.
1206	Dolomite.....	Parish mine, St. Lawrence Co., N. Y.
1207	Dolomite.....	Lee, Mass. Pickett Collection.
1208	Dolomite.....	Lockport, Niagara Co., N. Y. Pickett Collection.
1209	Dolomite (Pearl Spar) in Talc.....	Marlboro, Vt.
1210	Dolomite (Rhomb Spar) in Talc.....	Marlboro, Vt.
1211	Magnesite in granite.....	
1212	Magnesite in Serpentine.....	Hoboken, N. J.
1213	Magnesite.....	Chester Co., Penn.
1214	Dolomite (Gurhofite).....	
1215	Siderite (Spathic Iron).....	Van Rensselaer Collection.
1216	Siderite.....	
1217	Siderite (Spathic Iron) and Quartz,	Mine Hill, Roxbury, Conn.
1218	Siderite (Sphaerosiderite).....	Hanau, Steinheim, Ger.
1219	Siderite (Sphaerosiderite).....	Hanau, Steinheim, Ger.
1220	Siderite (Spathic Iron).....	Antwerp, Jefferson Co., N. Y. Pickett Collection.



## Number.

- 1221 Siderite (Spathic Iron).....Rochester, Monroe Co., N. Y.  
Pickett Collection.
- 1222 Siderite.....
- 1223 .....
- 1224 Siderite and Galenite.....Harz, Saxony.  
Gebhard collection.
- 1225 Siderite (Spathic Iron) and Cacozenite,  
Antwerp, Jefferson Co., N. Y.  
Pickett Collection.
- 1226 Siderite and Galena..... Albemarle Co., Va.
- 1227 Siderite.....
- 1228 Siderite and Zinc blende.....Roxbury, Conn.
- 1229 Siderite (Spathic Iron).....  
Van Rensselaer Collection.
- 1230 Siderite.....
- 1231 Siderite.....
- 1232 Siderite (Spathic Iron) and Galena..... Roxbury, Conn.
- 1233 Arragonite .....Ball's Cave, Schoharie Co., N. Y. 148  
Simms Collection.
- 1234 Arragonite.....Schoharie, Schoharie Co., N. Y.  
Gebhard Collection.
- 1235 Arragonite .....  
Van Rensselaer Collection.
- 1236 Arragonite .....  
Van Rensselaer Collection.
- 1237 Arragonite .....  
Van Rensselaer Collection.
- 1238 Arragonite .....
- 1239 Arragonite.....  
Van Rensselaer Collection.
- 1240 Arragonite .....
- 1241 Arragonite (nodules),  
Mammoth Hot Springs, Yellowstone Nat. Park, Montana.
- 1242 Arragonite.....Hot Springs, Venus bath, Yellowstone.
- 1243 Arragonite.....Hot Springs, Venus bath, Yellowstone.
- 1244 Arragonite.....  
Van Rensselaer Collection.
- 1245 Zaratite.....Texas, Lancaster Co., Pa.
- 1246 Hydrozincite.....Franklin, N. J.
- 1247 Malachite .....  
Van Rensselaer Collection.
- 1248 Malachite .....Arizona.
- 1249 Malachite.....Melancias, P. de Minas.  
Brazilian Collection.
- 1250 Malachite .....  
Gebhard Collection.
- 1251 Malachite.....Amador Co., Cal.
- 1252 Malachite .....  
Gebhard Collection.
- 1253 Malachite .....Flemington, N. J.  
Gebhard Collection.

Number.	
1254	Malachite ..... Schuyler mines, Belleville, N. J.
1255	Malachite ..... Bristol, Conn. From A. Marks.
1256	Malachite..... Lake Superior.
1257	Malachite..... Rio Jauru, P. de Matto Grosso. Brazilian Collection.
1258	Malachite.....
1259	Malachite.....
1260	Malachite..... Cacapava, S. Pedro do Sul. Brazilian Collection.
1261	Malachite.....
1262	Hydromagnesite..... Hoboken, N. J. From Prof. Leeds.
1263	Malachite.....
1264	Malachite..... Van Rensselaer Collection.
1265	Malachite..... Chili, S. America. Pickett Collection.
1266	Malachite and Caprite ..... Minas Salado, Brazil.
1267	Malachite..... Gebhard Collection.
1268	Azurite .....
1269	Azurite and Malachite.....
1270	Azurite..... Van Rensselaer Collection.
1271	Azurite.....
1272	Azurite and Chrysocolla.....
1273	Malachite and Azurite on chalcopyrite .....
1274	Peat ..... Cayuga Co., N. Y. 121 Simms Collection.
1275	Peat ..... Cayuga Co., N. Y. Simms Collection.
1276	Lignite ..... Manaos, P. d'Amazona. 8 Brazilian Collection.
1277	Coal..... Do Jaguarao, S. Pedro do Sul. Brazilian Collection.
1278	Peat..... Snedecor's landing, Rockland Co., N. Y.
1279	Brown-Coal..... Curral Alto, S. Pedro de Sul. 5
1280	Lignite..... Camaragibe, P. de Alageas. 9 Brazilian Collection.
1281	Coal..... Rock Spring, Nat. Park, Wyoming.
1282	Lignite..... Barcellos, P. de Bahia. Brazilian Collection.
1283	Coal ..... Do Jaguarao, S. Pedro do Sul. Brazilian Collection.
1284	Brown Coal..... 2 Brazilian Collection.
1285	Brown Coal..... 4 Brazilian Collection.
1286	Brown Coal..... 1 Brazilian Collection.

Number.

1287	Brown Coal.....	3
	Brazilian Collection.	
1288	Peat.....	
1289	Peat (Pot-hole, Cohoes mastodon).....	Cohoes, Albany Co.
1290	Peat (Pot-hole, Cohoes mastodon).....	Cohoes, Albany Co.
1291	Peat (Pot-hole, Cohoes mastodon).....	Cohoes, Albany Co.
1292	Peat.....	Copenhagen, Lewis Co.
1293	Strontianite.....	Schoharie, Schoharie Co., N. Y.
1294	Strontianite.....	Schoharie, Schoharie Co., N. Y.
1295	Strontianite.....	Schoharie, Schoharie Co., N. Y.
1296	Strontianite.....	Schoharie, Schoharie Co., N. Y.
1297	Strontianite.....	Schoharie, Schoharie Co., N. Y.
1298	Strontianite.....	Schoharie, Schoharie Co., N. Y.
	Beck Collection.	
1299	Strontianite, in water-lime group,	Schoharie, Schoharie Co., N. Y.
1300	Strontianite, in water-lime group,	Schoharie, Schoharie Co., N. Y.
1301	Strontianite, in water-lime group,	Schoharie, Schoharie Co., N. Y.
1302	Strontianite, in water-lime group,	Schoharie, Schoharie Co., N. Y.
1303	Strontianite, in water-lime group,	Schoharie, Schoharie Co., N. Y.
1304	Strontianite, in water-lime group,	Schoharie, Schoharie Co., N. Y.
1305	Strontianite.....	
1306	Strontianite.....	Schoharie, Schoharie Co., N. Y.
1307	Strontianite and Calcite...	Schoharie, Schoharie Co., N. Y.
1308	Strontianite and Calcite...	Cobleskill, Schoharie Co., N. Y.
1309	Strontianite.....	Grose isle, Lake Erie.
1310	Strontianite.....	Schoharie, N. Y.
1311	Strontianite, with native sulphur....	Girganti, Sicily, Italy.
1312	Cerussite and Copper Pyrites.....	
	Van Rensselaer Collection.	
1313	Cerussite.....	Pennsylvania.
1314	Cerussite, Copper, etc.....	Sette Lagoas, P. de Minas.
	Brazilian Collection.	
1315	Cerussite and Malachite.....	Germany.
1316	.....	
1317	Petroleum.....	Oil wells, Penn.
	From A. W. Haskins, Buffalo.	
1318	Petroleum (purified).....	Oil wells, Penn.
1319	Petroleum.....	Gardner well, Penn.
1320	Petroleum.....	Gardner well, Penn.
1321	Petroleum.....	Gardner well, Penn.
1322	Asphaltum in Limestone.....	Dead Sea.
1323	Bitumen in Calcite.....	Flat Creek, Montgomery Co., N. Y.
1324	Bitumen (indurated) in Dolomite,	Fort Ann, Washington Co., N. Y.

## Number.

- 1325 Bitumen (indurated)... Flat Creek, Montgomery Co., N. Y.  
 1326 Bitumen (indurated)... Flat Creek, Montgomery Co., N. Y.  
 1327 Bituminous Schist.....Sarocaba, P. de S. Paulo.  
       Brazilian Collection.  
 1328 Bituminous Coal.....Mt. Lebanon.  
 1329 Elaterite, (mineral Caoutchouc) .....  
 1330 Elaterite, (mineral Caoutchouc) .....  
 1331 Bitumen .....California.  
       From George W. Pine, Herkimer.  
 1332 Succinite (Amber) .....New Jersey.  
 1333 Asphaltum.....Dead Sea.  
 1334 Asphaltum (Albertite).....Albert mine, Nova Scotia.  
       Pickett Collection.  
 1335 Asphaltic Limestone... ..Maran (Ilheos), P. de Bahia. 11  
       Brazilian Collection.  
 1336 Bituminous Schist.....Tabatinga, P. de Amazona. 7  
       Brazilian Collection.  
 1337 Bitumen (indurated) .....  
 1338 Schist, fetid.....Da'Chapada, P. de Maranhao, Brazil.  
 1339 Illuminating Clay .....Camauru, P. de Bahia.  
       Brazilian Collection.  
 1340 Anthracite .....Lehigh Co., Penn. 287  
       Simms Collection.  
 1341 Gypsum.....Mammoth Cave, Kentucky.  
       From Henry Russel.  
 1342 Gypsum.....Mammoth Cave, Kentucky.  
       From Henry Russel.



## REPORT OF THE STATE GEOLOGIST.

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*To the Honorable the Board of Regents of the University of the State of New York :*

Under the provisions of chapter 355 of the Laws of 1883, it is provided that the State Geologist shall communicate to the Board of Regents the results of his scientific researches, in lieu of the annual reports previously required by law.

In presenting for the first time a report of the State Geologist to the Regents of the University, I beg leave to state some facts which may not be familiar to every member of the Board.

When the preparation of the Palæontology of the State was committed to my charge as State Geologist, no annual reports were required, as I have elsewhere stated, and this I believe to have been unfortunate, since the long intervals between the publication of the quarto volumes left the public uninformed of the progress of the work, except as incidentally shown in the publications of the State Museum. Finally in 1881, the Legislature incorporated in the general appropriation bill a clause making it "the duty of the State Geologist to communicate to the Legislature, on or before\* the first day of March of each and every year, a report upon the condition of any work for the State upon which he may be engaged." In accordance with this requirement, three reports have been submitted to the Legislature. Copies of these reports are herewith communicated, and from their contents and the present report, it will be seen what has been already accomplished, and what is the present condition of the work which has been committed to the State Geologist.

The report made to the Legislature in 1882 presents a general statement of the nature of the work, with an enumeration of the volumes published up to that time, and the condition of the work then in progress. In order to give some definite idea regarding the work which at that time occupied the State Geologist, the report was accompanied by a synopsis of the fossil Lamellibranchiate shells, with illustrations, in twelve plates, giving the principal genera known in the upper members of the New York Geological series. As therein stated, eighty plates of this class of fossils had already been lithographed and printed many years before, but no provision existed for publication. Since that time, a law has been passed for the completion of the work, and a volume embracing descriptions and illustrations of less than one-half the known species of that class of fossils, in the rocks mentioned, has been finished. The printing of the remaining portion, Part II, of the Lamellibranchiata has been delayed, in the first place by my own illness, and since October, by the necessity of preparing material to illustrate the mineral resources of the State of New York in the New Orleans Exposition. This portion of the work will however soon be in the hands of the printer.

In the report made to the Legislature in 1883, I have given a resumé of the condition of the work done and in progress. In order to present

before the public some tangible proof of the statements therein and previously made, I communicated a special paper on the relations of certain genera of the Bryozoans, together with copies of the plates of Corals and Bryozoans, as far as completed, which go to make up Vol. VI of the Palæontology; and also a set of twenty-seven plates of Brachipoda, which had been completed many years since, together with explanations of the same. All the plates here mentioned have been reproduced in Photo-Lithography, and serve to illustrate the character and scope of two of the volumes of Palæontology yet to be published.

The report made to the Legislature in 1884 contains little beyond the descriptions of species of Bryozoans which are to be included in Vol. VI of the Palæontology of New York.

With the report of 1883, I communicated an outline map as a basis for a geological map of the State, together with colored maps, of some portions of the country which had been more critically studied, for incorporation in the general map. A contract was made by the State printer with Messrs. Julius Bien & Co., of New York to prepare a base for this geological map. A proof sheet of the western half of the map was finished, and this portion was returned with corrections. No complete copy of this map was furnished till the spring of 1884. A critical examination of the map showed such deficiencies in the representation of the drainage and other important features, that it was impossible to lay down accurately the limits of the geological formations. This deficiency may be remedied when the engraver shall have transferred, from a more correct topographical map, the water-courses which will often mark the boundaries or the limits of succession in the geological formations.

Owing to the accumulation of work, both preparatory and for several years in the hands of the printer, it was found impossible to give the time necessary for the completion of a geological map which would be worthy of publication by the State of New York. To issue a map based upon the work done more than forty-five years ago would have been inexcusable, and with no means for field-work at the disposal of the State Geologist he has been able to do little more than to study and determine some points or small areas of country, either by himself or by the aid of assistants engaged in the collection of fossils. He has also, in former years, and from time to time, employed special assistants at his own personal expense and without any appropriation from the State.

In 1881 the Legislature appropriated the sum of \$1,000 for the purposes of work upon certain geological formations in the southern counties of the State, preparatory for the completion of the Geological map. This appropriation was vetoed by the Governor. The field-work, however, had already been commenced, and it was continued for the season at the personal expense of the State Geologist.

During the past year some geological work was done in Otsego and Chenango counties, with a view of comparison with the results of work done in that region between 1868 and 1871. In the autumn of last year (1884), I employed Mr. C. E. Hall to make some investigations for rectifying the limits of the geological formations in Saratoga, Warren and Washington counties, which we know to be incomplete and erroneous in their representation on the map. The investigation, however, was interrupted after a month of field-work, and the results, while contribut-

ing much to our knowledge of the limits and trend of certain formations, showed more clearly the necessity of farther exploration, before any creditable geological map of that part of the State can be completed.

I would most earnestly recommend that the completion of this important field-work be undertaken during the coming season, and that the State Geologist be authorized to employ some competent person under his immediate supervision to carry on the work in a systematic manner to its completion.

Some important contributions to our knowledge of the limits of the Chemung and Waverly groups, in the south-western part of the State and adjacent parts of Pennsylvania, have been made by Mr. C. E. Beecher, of the State Museum, as the results of his own observations and those of Mr. F. A. Randall, of Warren, Penn. Our information regarding the position of the Panama conglomerate of the Chemung group in Chautauqua county, and the relation of the upper members of this group with the Waverly group above, has been materially enhanced through the investigations made by Dr. J. W. Hall and Mr. George B. Simpson in their field work and collection of fossils during the past autumn in the same part of the country.

In the mean time (1884) Major Powell, Director of the United States Geological Survey, had proposed to complete and publish a geological map of the three States, New York, New Jersey and Pennsylvania, with a view of illustrating the geological order, subdivisions and nomenclature of the older formations in those States where the earlier geological surveys had already accomplished so much work. To aid in this object I furnished a copy of the map engraved by Julius Bien & Co., together with other maps, containing all the geological information possessed by us, for the use of the United States Geological Survey. This information has been transferred to a map more correct in its topography and on a larger scale; but since the accurate limits of the geological formations in the State of New York are confessedly incomplete, it is consequently impossible to satisfactorily adjust the New York cartography to that of Pennsylvania, and the publication of the combined map has been deferred.

Since the passage of the law extending the Geological and Geographical Surveys of the General Government over all the States and Territories of the Union I have sought to aid in establishing a cordial co-operation between the several State Geologists and the Director of the United States Geological Survey. Although at first opposed to and protesting against such extension of the survey by the General Government, I have become convinced, from my own experience, that few, if any, of the individual States will ever provide the necessary means for carrying on to proper completion the work of a geological survey.

In the State of New York—the most liberal, perhaps, of all the States in its publications—the work has been carried on under great disadvantages, delays, and great loss of time, and always with an element of uncertainty. At no time in the past has the State Geologist felt secure in the necessary legislative support for the completion of the work in which he has been engaged. In the original plan and organization of the Palæontological work, the great importance and final necessity of an accurate geological map of the State had not been sufficiently recognized, a desideratum so absolutely indispensable for the



proper appreciation of its Palæontology, for the intelligent estimation of its own mineral and economic resources, and its vital relations to adjacent States. Feeling that the reputation of the State was involved in this matter, as well as his own personal reputation, your State Geologist, has sought to overcome the difficulties in the way by availing himself of the co-operation kindly offered by the Director of the United States Geological Survey, to aid in carrying out the original plan of our own survey, and in completing a proper geological map of the State, for publication by the Legislature of New York.

Some time since Major Powell offered to send a competent man to Albany to color a geological map under my direction. Pursuant to this arrangement Mr. W. J. McGee, one of the geologists in the United States Geological Survey, and a most able geological cartographer, came to Albany to carry out this plan. He also made, with me, several excursions into the field for the purpose of correcting former observations and of obtaining more accurate data for the completion of a geological map. We have been extremely careful to color no part of the map where the geological structure is not known, or where grave doubts exist regarding the received opinions of the geological structure and relations. Under this restriction a very considerable portion of the map will remain uncolored, but we shall have the great satisfaction of seeing what part of the State is known and what are the limits and extent of the unknown or incompletely determined areas; — those where critical work must be done before a complete geological map of the State can be presented.

The advantages of thus leaving uncolored all that is not fully known, or which requires further investigation, as in the instance cited of Saratoga and Warren counties, as also considerable portions of Washington, Rensselaer and Columbia counties, are that this knowledge may be introduced and expressed upon the map as it shall be ascertained by careful observation.

By the arrangements thus made I shall be able to present a colored copy of the geological map of the State, restricted as above, during the early part of February, which will be communicated to the Legislature during that month.

I may state in this place that if the Legislature refuse to order the publication of this map the United States Geological Survey will undertake its publication. I cannot believe, however, that there remains so little State pride as to permit this; still there will be, in such case, no other alternative.

There are many reasons why I greatly prefer to accept the co-operation of the United States Geological Survey instead of leaving the control of the work in the hands of that organization; and, also, I believe that the Director of the Survey, himself, will fully coincide with me in that opinion.

By co-operation your work will be better accomplished, it will come before the public as under the auspices of the State authorities, and your State Geologist will be able to work with more freedom, and will be relieved of many burdens and anxieties assumed by him and consequent upon his relations with the State, and he will no longer be working as an isolated individual.

Through this co-operation better influences will be brought to our



aid within the State. The fact that the United States Geological Survey is interested in our work and co-operating with us will greatly aid in giving us the support which we need. Arguments might be multiplied and extended. It is not only for the immediate occasion that I advise this coöperation, but for all the future, in all the scientific investigations and publications which may be proposed or undertaken by the State.\*

Leaving in your hands the decision of the questions presented above, I am, very respectfully,

Your obedient servant,

JAMES HALL,

*State Geologist.*

ALBANY, N. Y., *January 1, 1885.*

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\* Since the presentation of this report to the Board of Regents, the following action has been taken by the Legislature and by the Governor in regard to the publication of the Geological map. This map was communicated to the Legislature with the report of the State Geologist and was referred by the Assembly to the Committee on Public Printing. The House and Senate Printing Committees met in joint session and recommended the printing of one thousand copies. A resolution embracing this recommendation was passed by the two Houses, as a joint resolution. The committee also recommended, that the sum of \$2,500 be appropriated for the purposes of this resolution. An item in the supply bill providing for the payment of this amount, on the certificate of the Secretary of the Board of Regents, passed the two Houses of the Legislature. The Governor has thought proper to veto this item and therefore there are no means for the publication of the Geological map.



# REPORT OF THE STATE ENTOMOLOGIST.

OFFICE OF THE STATE ENTOMOLOGIST, }  
ALBANY, *January 6, 1885.* }

*To the Honorable Board of Regents of the University of the State of New York:*

GENTLEMEN — I beg leave to present the following report of some of the operations of my department, for the year 1884 :

The work of the office has been assiduously carried on during the year. Fortunately for the agricultural interests of the State, no insect attack of unusual extent has been made upon any of the principal crops, nor have we to record the introduction from abroad of any very injurious insect pest.

So varied, however, is the economy of insect life, and so different are the conditions under which it presents itself to our notice, that even without any special and unusual subject of investigation, the past year has brought with it many forms and phases of insect attack of so interesting and important a character as to occupy all the time that could be devoted to their study.

To the larger number of these, my attention was called by requests made to me for the name of the insect, an account of its habits, changes, continuance, etc., and the best means for preventing its injuries.

To all such inquiries I have returned full reply whenever possible to do so, even when it has been necessary, in the case of new forms of attack, to make special study before satisfactory information could be given, and feasible and effectual remedies suggested.

By this means, I have endeavored to show the value of this department to the agriculturist, orchardist, gardener, and to community in general, in the confidence that with its work more widely known and appreciated, calls for its assistance would be more frequently made upon it, and the sphere of its usefulness thereby greatly extended.

It has been very gratifying to me that in several instances I have been able to indicate such measures of relief from insect depredations, that the success attending their use has been so signal as to demonstrate the value of the studies and investigations in economic entomology.

## SPECIAL STUDIES.

Of the following insects, special study has been made by me during the past year, in consideration of (with one exception) injuries caused by them within our State :

- Wheat joint-worm, *Isosoma tritici* Riley.
- Squash-vine borer, *Melittia cucurbitæ* (Harris).
- Angoumois moth, *Sitotroga cerealella* (Oliv.)
- Great Leopard moth, *Ecpantheria scribonia* (Stoll).
- Apple maggot, *Trypeta pomonella* Walsh.

White grub, *Lachnosterna fusca* (Frohl.)  
 Strawberry crown borer, *Otiorhynchus ligneus* Oliv  
 ———, *Tribolium ferrugineum* (Fabr.)  
 Punctured clover-leaf weevil, *Phytonomus punctatus* (Fabr.)  
 Peach-root aphid, *Myzus* sp.?  
 Box psylla, *Psylla buxi* (Linn.)

The results of such study will appear in a report which I hope soon to present to your honorable Board.

#### PUBLICATIONS.

As many of the cases of insect attack submitted to me for information and advice were not confined to a single locality, but were of general importance, I have usually in such instances availed myself in my replies of the columns of agricultural and other journals, through which the desired publicity might be given. The larger number of my communications of this character have been contributed to the *Country Gentleman*, published in this city — a leading agricultural journal of extensive circulation, reaching in its distribution nearly every State of the Union, through one-seventh of the entire number of post-offices in the United States.

As a record of work in this direction, and as a means of reference for those who may desire to consult any of the articles, a list of my publications during the year is herewith given :

#### A NEW SEXUAL CHARACTER IN THE PUPÆ OF SOME LEPIDOPTERA.

[*Psyche*, IV. No. 115-116, November-December, 1883, pp. 103-106] — Issued February 11, 1884. An abstract in *Proceedings of the American Association for the Advancement of Science*, held at Montreal, Canada, August, 1882, xxxi, 1883, pt. II, p. 470-471.]

Remarks upon the interest attaching to the sexual characteristics of insects ; mentions a number of such sexual features ; they are fewer and less marked in the earlier stages. The particular feature noticed in this paper, is one pertaining to the *Cossinae* and to the *Egeridae*, viz. : in the male, the *tenth segment* of the pupa (not counting the head as one) is furnished with two rows of teeth, while the female uniformly has but one (as have the two following segments in each sex).

#### CRESSON'S UROCERAS — *Urocera Cressoni* Norton.

[*Country Gentleman* for January 3, 1884, XLIX, p. 9, c. 1 — 11 centimetres.]

In reply to an inquiry from Perth Amboy, N. J., the species is named, and its affinities given, and its habits in the larval and perfect stages. It occurs in the Middle States, and interesting varieties have been recorded from Albany, N. Y.

#### FULLER'S ROSE BEETLE — *Aramigus Fulleri* Horn.

[*Country Gentleman* for January 17, 1884, XLIX, p. 49, c. 2 — 32 cm.]

The species identified from Stamford, Conn. Its first notice as a pest in conservatories, in 1874, and its subsequent distribution ; its life-history, as given by Prof. Riley in the *Rept. Commis. Agricul.* for 1878 ; remedies for it, and reference to publications upon it.

#### THE LUNATED LONG-STING — *Thalessa lunator* (Fabr.)

[*Country Gentleman* for April 17, 1884, XLIX, p. 331, c. 3-4 — 52 cm.]

Captured in Augusta, Ga., while ovipositing, April 1st, identified, a figure given, and method of oviposition stated ; the insect upon the larva of which it is parasitic. *Tremex columba*, is also shown. A note from Prof. Riley is added, which gives the statement that the parasite feeds on the *Tremex* larva while attached to its exterior.



## AN INSECT ATTACK ON AN IULUS.

[The Canadian Entomologist for April, 1884, xvi, p. 80—7 cm.]

Communicating an observation of a swarm of minute insects surrounding, darting upon, and seriously annoying an Iulus. Could they have been Ichneumons?

## INSECT INJURY TO GRAPE-VINES.

[Country Gentleman for May 8, 1884, xlix, p. 397, c. 1—25 cm.]

Some pieces of grape-vines bearing pinhole-like punctures, from Hopkinsville, Ky., are recognized as having been punctured for oviposition, by *Ecanthus latipennis*—one of the flower crickets, closely allied to *Æ. niveus*. The punctures and method of oviposition are described and reference made to figures in Fifth Missouri Report on Insects, page 119. The punctures are not injurious to the vine, but the crickets may possibly cut the stems of the grapes.

## SQUASH BORERS.

[Country Gentleman for May 8, 1884, xlix, p. 397, c. 2—6 cm.]

Injuries to squash vines noticed in the *Country Gentleman* of April 24th, and there ascribed by the editor to the striped cucumber beetle, *Diabrotica vittata*, are recognized as caused by the squash-vine borer, *Melittia cucurbitæ*.

## THE PUNCTURED CLOVER-LEAF WEEVIL.

[Country Gentleman for May 29, 1884, xlix, p. 457, c. 2-3—56 cm.]

Larvæ submitted from East Avon, Livingston county, N. Y., prove to be the mature forms of *Phytonomus punctatus* (Fabr.). Its present known distribution is given, the transformations, description of its cocoon, and reference to writings upon it. Prompt resort to effective remedies is urged, of which are thorough plowing, and rolling the clover after twilight, at which time the larvæ are feeding.

The same, in the *Ontario County Times*, Extra, of May 29, 1884.

## A NEW CLOVER PEST—Its ravages in the southern portion of Canada.

[Ontario Co. Times, Extra, May 29, 1884—30 cm.; Ontario Co. Times of June 4, 1884, p. 3, c. 4-5—85 cm.]

Examples of the larvæ sent by the editor are identified as *Phytonomus punctatus*. To resist the attack plowing is recommended, rolling not being as useful now after the insect has entered the ground for pupation. Reference is made to the notice of the insect in the *Country Gentleman* of May 29, and its republication recommended to the editor, which is accordingly done.

## A CORN CUT-WORM.

[Bulletin No. LXXXVI, of the N. Y. Agricultural Experiment Station, Geneva, May 31, 1884—32 cm.]

In reply to an inquiry from Batavia, N. Y., of a cut-worm cutting off corn at the surface of the ground, the different habits of cut-worms are referred to, and recommendation is made of poisoning them by sprinkling London purple over the plants. Another method which has proved quite effective is to employ boys to dig them from the hills—mention of a crop saved by this means.

THE WHITE GRUB OF THE MAY BEETLE—*Lachnosterna fusca*. Read before the New York State Agricultural Society at the annual meeting January 16, 1884.

[Forty-third Annual Report of the N. Y. State Agricultural Society for the year 1883 [June 5], 1884, pp. 20-87, 5 figures.]

Gives an epitome of what is known of this serious pest, and indicates what is needed to complete its life-history. It is treated of under the following heads: The beetle; the white grub; the egg; injurious character of the insect, injuries from the grub; injuries of the beetle; life-history, distribution; its enemies; preventives and remedies; study of the insect desired.

THE SQUASH-VINE BORER—I. *Melittia cucurbitæ*.

[Country Gentleman for June 5, 1884, xlix, p. 477, c. 2-4—50 cm.]

Gives, in reply to inquiries made from Coxsackie, N. Y., descriptions of the caterpillar and moth of the above-named insect, and remarks upon the family of *Agerida*, to which it belongs.

## THE SQUASH-VINE BORER — II.

[Country Gentleman for June 12, 1884, XLIX, p. 497, c. 2-3 — 40 cm.]

The life-history, so far as known, and habits of the insect are given. Its injuries appear to be increasing with the increase of cultivation of the Hubbard squash. Its abundance at times is shown in the fact that 142 larvæ have been cut from a single vine.

## THE SQUASH-VINE BORER — III.

[Country Gentleman for June 19, 1884, XLIX, p. 517, c. 1-3 — 74 cm.]

Treats of remedies and preventives, viz.: Autumn plowing and harrowing, gas-lime, kerosene oil, strong-smelling substances as counter-odorants (especially bisulphide of carbon), covering the plants with netting, cutting out the larvæ, rooting the plants at the joints, guano and London purple and saltpetre. Additional observations are asked for upon points mentioned.

THE BACON BEETLE — *Dermestes lardarius* Linn.

[Country Gentleman for June 26, 1884, XLIX, p. 537, c. 2 — 25 cm.]

The beetle and larva are described, their food stated, allied species referred to, and inclosing bacon, etc., in whitewashed paper or cloth bags recommended as the best protective from attack. No method is known of preventing attack upon salted meats if exposed to the insect.

## THE MAPLE TREE SCALE-INSECT.

[Country Gentleman for July 3, 1884, XLIX, p. 556-7, c. 4-1 — 20 cm.]

Identifying *Lecanium innumerabilis* Rathvon, from Phoenix, N. Y., June 6; describing the scales as at present with the eggs beneath them, and later, when the eggs are extruded, enveloped in waxy fibres. The active larval stage the best time for killing the insects, with whale-oil soap solution or kerosene and milk emulsion.

THE SPRING CANKER-WORM — *Anisopteryx vernata* (Peck).

[Country Gentleman for July 10, 1884, XLIX, p. 577, c. 2-3 — 30 cm.]

In answer to inquiries and examples sent from two localities in Westchester county, N. Y.—identification of the species, remarks upon the importance of arresting its spread in the State, and recommendation of destroying the pupæ in the ground beneath the trees; arresting the ascent of the female moth by tarring the trunks or by tin bands; jarring the larvæ from the limbs into a straw fire beneath, and spraying the tree with Paris green or London purple in water.

## THE BUFFALO GNAT.

[Country Gentleman for July 10, 1884, XLIX, p. 577, c. 3-4 — 52 cm.]

The gnat is an undescribed species of *Simulida*, few of which family have been studied—even the "black fly" of the Adirondack region bears only a manuscript name. The habits and transformations of the *Simulida*, in general, are given, with references to particular species observed. Various notices of the buffalo gnat are quoted.

## THE CARPET BUG.

[Amsterdam (N. Y.) Daily Democrat for July 21, 1884, p. 3, c. 3-4 — 68 cm.]

In a letter to the editor in reply to inquiries, are given—What the insect is; habits of the insect, not possible to exterminate it; means of protection; means of destruction; hunting the "bug" urged.

## THE ELM TREE BEETLE.

[New York Weekly Tribune for July 23, 1884, p. 10, c. 4 — 13 cm.]

Referring to a recent statement in the *Tribune* that the elm trees in Flushing, L. I., were being destroyed by this insect, recommendation is made of the method given by Mr. Glover in the agricultural report for 1870, of placing frames around

the base of the trees, so constructed as to prevent the egress of the larvæ that descend the trunks for pupation and their entrance into the ground, by a layer of cement. The northward progress of the insect in New York is stated.

### THE CARPET BEETLE — *Anthrenus scrophulariæ* Linn.

[Country Gentleman for August 14, 1884, XLIX, p. 676-7, c. 3-1 — 48 cm.]

Gives in reply to inquiries from Manchester, Vt., its habits, habitat, injuries, materials eaten, and transformations. Among the best preventives and remedies are mentioned carbolic acid, creosote, gas-tar paper, benzine and kerosene, cyanide of potassium, fumigation of closets with sulphur, and frequent searches for the larvæ.

### INSECTS MINING BEET LEAVES.

[Country Gentleman for August 14, 1884, p. 677, c. 2 — 13 cm.]

Leaves sent from Erie, Pa. are infested with larvæ of a species of the *Anthomyiidae*, probably one of the three species mentioned in my *First Report on the Insects of New York*, pp. 203-211. Some of the characteristics of these flies are given, with notice of their mining operations in this country.

### PEACH ROOT APHIS.

[Gardener's Monthly and Horticulturist, Phila., September, 1884, xxvi, pp. 271-2 — 29 cm.]

A root aphis which is destroying all the seedling peach trees of Mr. Lorin Blodget, at Philadelphia, is believed to be *Myzus persicæ* Salzer. For destroying it the following are suggested: Hot water, leached ashes and sulphur, bisulphide of carbon and soluble phenyle. As superior to the above, the sulpho-carbonates are recommended, and M. Dumas, of the French Academy, quoted upon their use.

### A NEW ROSE PEST — *Homoptera lunata* (Drury).

[Country Gentleman for September 4, 1884, XLIX, p. 737, c. 1-2 — 25 cm.]

Caterpillars feeding at night upon rose buds in a rose-house in Madison, N. J., prove to be *Homoptera lunata*. This food-plant had not been previously recorded. The life-history of the species, as detailed by Prof. French, is given, together with Guenée's description of the caterpillar; also mention of the sexual difference in the moths, and the distribution of the species. Injury from the larvæ in rose-houses best prevented by hand-picking them.

### JUMPING SEEDS.

[Country Gentleman for September 11, 1884, XLIX, p. 757, c. 1-2 — 40 cm.]

The seed-vessels described — said to be a species of *Euphorbia*. The contained insect (a lepidopter) causing the motion, was described and named as *Carpocapsa saltitans*, by Prof. Westwood, in 1858, later by M. Lucas as *C. Deshaiziana*. The interesting generic relation of the insect is referred to, its leaps described, their cause explained, and period of emergence of the moth stated. Three other kinds of jumping seeds are known. Reference to further information.

### THE WHITE GRUB — *Lachnosterna fusca* (Frohl.).

[Country Gentleman for September 11, 1884, XLIX, p. 757 c. 2-3 — 22 cm.]

In reply to inquiries from West Stockbridge, Mass., of remedies, etc., reference is made to a paper upon the insect giving about all that is known of it, published in the *Forty-third Annual Report of the New York State Agricultural Society*, for 1883. The starvation remedy, as there given and believed to be effectual, is quoted.

### AN INSECT ATTACK NEW TO THE STATE — *Isosoma tritici*, on wheat, in Geneva.

[Bulletin 100, New York Agricultural Experiment Station, Geneva, N. Y., Oct. 4, 1884 — 86 cm.]

First noticed in Illinois in 1880; its difference from *Isosoma hordei*; location in the upper internodes of the straw; the larvæ more abundant in the straw exam-

ined than elsewhere seen ; the wheat greatly shriveled ; life-history of the insect, its description ; two parasites infest it : remedies found in burning the stubble and straw ; preventive in rotation of crops.

### A STINGING BUG — *Melanolestes picipes* H.-S.

[Country Gentleman for October 23, 1884, XLIX, p. 877, c. 2-3 — 40 cm.]

An insect reported as inflicting a painful sting upon a lady in Natchez, Miss., is *Melanolestes picipes*, or the "Black Corsair." It is distributed over the United States, and has been previously noticed for the serious wounds it inflicts. Other Hemiptera of the *Reduviidæ* having similar stinging habits, are the *Conorhinus sanguisuga* Leconte, *Melanolestes abdominalis* (H.-S.), *Reduvius personatus* (Linn.), and *Prionotus cristatus* (Linn.). The above are briefly noticed in their habits and painful wounds.

### AN ATTACK UPON THE APPLE-WORM — A Friend, not a Foe.

[Country Gentleman for October 30, 1884, XLIX, p. 897, c. 2-4 — 52 cm.]

A larva sent from Crozet, Va., as injurious to apples, from eating large holes into their sides and causing rot, proves to be that of *Chauliognathus marginatus* (Fabr.). It is not injurious, but enters apples through holes already made, to feed upon the apple-worm — the larva of *Carpocapsa pomonella*. The larva and beetle are described, the latter by comparison with *Ch. Pennsylvanicus*. The holes in quinces, thought to have been made by the same larva, are probably those of the quince curculio, *Conotrachelus crataegi*, in leaving the fruit.

### CLOVER INSECTS.

[Transactions of the N. Y. State Agricultural Society, XXXIII, 1877-1882, [October], 1884, pp. 206-207.]

In the republication of the paper on "The Insects of the Clover Plant," from the annual report of the society for the year 1880, a list of the names with reference to authorities of twenty-four species is given, as an addition to the forty-six previously recorded, making the number now known, seventy. Mention is made of the list of apple insects (additions in MS) being extended to one hundred and eighty.

### THE WHITE GRUB.

[The New England Homestead for November 8, 1884, XVIII, p. 393, c. 1-3 — 80 cm.]

Treats of the insect under the following heads : The grub, the beetle, its distribution, its food-plants, injuries by the beetle, life-history, its enemies, preventives and remedies. Under the latter head, salt is recommended as an experiment, while starvation is pronounced infallible.

### REPORT of the State Entomologist to the Regents of the University of the State of New York, for the Year 1883.

[Thirty-seventh Annual Report on the New York State Museum of Natural History, by the Regents of the University of the State of New York, (November), 1884, pp. 45-60.]

Reports upon the collections made during the year and other work of the entomologist. Among insects of special interest collected are some *Trypetidæ* — *Graptæ Faunus* and *G. j-album*, *Fenisea Tarquinius*, *Agrius torpidus*; remarks upon *Agrotis clandestina* and *Simulium molestum*; notice of the operations of *Orygia leucostigma* in girdling elm twigs and causing them to drop; the English sparrow promoting insect injury; an extended notice of the appearance of the chinch-bug, *Blissus leucopterus*, in northern New York, with recommendations made, and distributed in a circular, for the arrest of its ravages.

### THE APPLE-LEAF BUCCULATRIX.

[The Husbandman (Elmira, N. Y.) for December 3, 1884, XI, No. 537, p. 1, c. 5 — 31 cm.]

Apple twigs received from Malcolm, Seneca county, N. Y., are covered with the cocoons of *Bucculatrix pomifoliella*. The cocoon is described and life-history of the species given. The remedies mentioned are spraying, or scouring with a stiff brush the infested branches with a kerosene oil and soap emulsion, of which the formula is given, for killing the insect within the cocoon; Paris green in water for poisoning the caterpillars, and jarring the caterpillars from the trees and burning them in the months of July and September.



## COLLECTIONS.

The collections made during the year have not been large. The appropriation by the Legislature for traveling and other expenses of the office commenced only on October 1st; other duties of the office, of greater importance at the present, occupied most of my time. No special excursions for collecting purposes have therefore been made. Quite an amount of material has, however, been obtained in the course of my studies and during a two weeks' vacation among the Catskills, in Palenville and the Kaaterskill Clove. The following is the enumeration in the several orders. Number of specimens mounted :

Hymenoptera .....	53
Lepidoptera .....	48
Diptera .....	49
Coleoptera.....	326
Hemiptera.....	157
Orthoptera.....	11
Neuroptera.....	8
Biological .....	III

Of unmounted specimens there are :

Hymenoptera.....	220
Coleoptera .....	777
Biological .....	about 600

Making a total of specimens..... 2,360

## CONTRIBUTIONS.

The following contributions have been made to the department :

*Monohammus confusor* Kirby : five examples, collected at Sodus Bay, N. Y. By Mrs. M. A. B. KELLY, Albany, N. Y.

The same, one example. By A. C. NELLIS & Co., Canajoharie, N. Y.

The same. By JOHN CHESTER, Albany, N. Y.

*Hydrophilus triangularis* (Say). By DUDLEY W. DEWITT, Albany, N. Y.

*Coptocycla aurichalcea* (Fabr.), taken upon *Calystegia sepium*. By Hon. G. W. CLINTON, Albany, N. Y.

Hibernated elm-tree leaf-beetles, *Galerucella xanthomelæna* Schr., April 28th; eggs of the same, on elm leaves, June 2d; larvæ and pupæ of the same, July 9th. By JAMES ANGUS, West Farms, N. Y.

*Phytonomus punctatus* (Fabr.), larvæ, about fifty specimens, from clover. By A. B. COCKINGHAM, East Avon, Livingston Co., N. Y.

The same, from a clover field. By CHARLES F. MILLIKEN, Canandaigua, N. Y.

The same in the beetle stage, feeding upon beans, July 2d. By J. F. ROSE, South Byron, Genesee Co., N. Y.

*Otiorynchus ligneus* (Oliv.), from a dwelling-house at Lycoming infested with them. By Dr. C. M. COE, Lycoming, Oswego Co., N. Y.

*Otiorynchus ligneus*, associated with *Anthrenus scrophulariæ* in a dwelling. By Prof. HENRY M. SEELY, Middlebury College, Middlebury, Vt.

*Anthrenus scrophulariæ* Linn., from Schoharie, N. Y. By Mrs. E. W. STREET, Albany, N. Y.

*Tribolium ferrugineum* (Fabr.), hundreds of specimens — infesting coarse flour "middlings" received from Chicago, Ill. By Messrs. DURANT & Co., Albany, N. Y.

*Artemegus Fulleri* Horn, from a conservatory. By J. L. SIMMONS, Stamford, Conn.

*Calandra oryzae* (Linn.), the rice weevil, infesting "rural branching sorghum seed;" many examples. By Dr. E. L. STURTEVANT, N. Y. State Agricultural Experiment Station, Geneva, N. Y.

*Megilla maculata* (De Geer), taken from corn upon which it was feeding. By Mr. STURGES, Fairfield, Conn.

*Adalia bipunctata* (Linn.), taken from a quince tree. By S. A. WALKER, Erie, Pa.

*Galerucella xanthomelæna* Schr., larva, pupa and imago; *Enchenopa binotata* (Say), the two-spotted tree hopper, fourteen examples. By Mrs. E. W. K. LASELL, Orange, N. J.

*Chauliognathus marginatus* (Fabr.), in the larval stage, taken from apples. By H. C. S., Crozet, Va.

Larva, pupa and imago of *Otiorhynchus ligneus*; larvæ of *Anthomyia* taken from the stomach of a robin. By CLARENCE M. WEED, Lansing, Mich.

*Bruchus obsoletus* (Say), from garden beans. By ISAAC COLES, Glen Cove, L. I.

*Macrodactylus subspinosus* (Fabr.), the rose beetle, with valuable notes upon its habits, and origin in sandy soil. By Mrs. L. G. CHRISMAN, Warren Farm, Chrisman, Rockingham Co., Va.

*Pomphopæa ænea* (Say), taken from wheat, butternut leaves and locust blossoms. By A. CASLER, Frankfort, Herkimer Co., N. Y.

*Crioceris asparagi* (Linn.), the asparagus beetle; many examples, in the egg, larval and perfect stages, collected at Geneva. By E. S. GOFF, Horticulturist N. Y. State Agricul. Experiment Station, Geneva, N. Y.

*Lycius opaculus* Leconte, burrowing in grape stalks. By HOMER F. BASSETT, Waterbury, Conn.

*Brachytarsus variegatus* Say, taken from a bin of newly threshed wheat. By C. A. GILLET, Shortsville, Ontario Co., N. Y.

*Pityophthorus puberulus* Leconte, obtained from pine twigs, into which the larvæ had burrowed; fifty or more examples. By CHARLES H. PECK, N. Y. State Museum of Natural History, Albany, N. Y.

Larva of *Nematus Erichsoni* Hartig, the Larch saw-fly, from tamarack. By Rev. THOMAS W. FYLES, South Quebec, Canada.

Wheat straw infested with *Isosoma tritici* Riley: from which was obtained December 23d and subsequently, the parasitic *Eupelmus Allynii* (French). By ROBERT J. SWAN, Rose Hill Farm, Geneva, N. Y.

Raspberry stalks containing cells of *Ceratina ampla* Say. By WM. H. EDWARDS, Coalburgh, W. Va.

A cluster of ichneumon cocoons on an apple twig, which disclosed *Apanteles congregatus* (Say). By T. J. HILL, Brooklyn, N. Y.

Larvæ of *Pieris rapæ* (Linn.), bearing the cocoons of one of its parasites, *Microgaster pieridis* Packard. By E. C. HILLS, East Hartford, Conn.

Larva of *Papilio Turnus* Linn., taken from a lemon tree, July 28th. By JAMES W. STEELE, Elizabethtown, N. Y.

*Vanessa Antiopa* (Linn.), larvæ of *Thyreus Abbotii* (Swains.), *Darapsa Myron* (Cramer), *Sphinx* sp.? and *Alypia octomaculata* (Fabr.), from grape-vines July 5th. By Dr. R. H. SABIN, West Troy, N. Y.

Eggs and young larvæ of *Darapsa versicolor* (Harris), occurring upon *Azalea* sp., July 21. Larvæ of *Tolype vellea* (Stoll), May 26th (failed to mature). By H. ROY GILBERT, Rochester, N. Y.

Larvæ of *Thyreus Abbotii* (Swains.), ten examples, from grape-vines; *Spectrum femoratum* Say, in act of moulting, June 16th; three cocoons of *Callosamia Promethea*, perforated by birds for feeding on the pupa. By S. C. BRADT, Albany, N. Y.

Larva of *Citheronia regalis* (Fabr.), taken from English walnut (*Juglans nigra*), August 22d. By WM. B. SPRAGUE, JR., Flushing, L. I.

Eggs of *Epantheria scribonia* (Stoll), from Florida, October 17th, from which the moths were obtained January 15th, *et seq.* By Mrs. JULIA P. BALLARD, Easton, Pa.

Larva of *Agrotis fennica* (Tausch.), quite injurious in meadows in northern Michigan. By Prof. A. J. COOK, Agricultural College, Lansing, Mich.

Larvæ of *Mamestra picta* (Harris), taken from peas and cabbage. By E. S. GOFF, Geneva, N. Y.

Larvæ of *Penthina umbatana* (Clemens), from rose bushes. By D. J. GARTH, Scarsdale, Westchester Co., N. Y.

Cocoons of *Bucculatrix pomifoliella* (Clemens), upon apple twigs. By J. S. ROYS, Lyons, Wayne Co., N. Y.

Examples of the same. By MALCOM LITTLE, Malcom, Seneca Co., N. Y.

*Sitotroga cerealella* (Oliv.), the Angoumois moth, in ears of dried corn, October 27th. By E. H. LADD, State Agricultural Experiment Station, Geneva, N. Y.

*Pæcilocapsus lineatus* (Fabr.), with gooseberry twigs injured by it. By E. S. GOFF, Geneva, N. Y.

The same, taken from garden sage. By J. G. FARGO, Batavia, N. Y.

The same taken on parsnips and currants. By J. F. ROSE, South Byron, N. Y.

*Lygus lineolaris* Beauv., feeding upon and deforming young pears. By Messrs. ELLWANGER and BARRY, Mount Hope Nurseries, Rochester, N. Y.

*Podisus cynicus* (Say), preying upon the currant-worm, *Nematus ventricosus* Klug. By SAMUEL G. LOVE, Jamestown, N. Y.

*Mytilaspis pomicorticis* Riley, on Kilmarnack willow, which it had nearly destroyed. By W. F. OSBORNE, Ansonia, Conn.

*Pulvinaria innumerabilis* (Rathvon), occurring upon grape vines. By Dr. N. C. SCUDDER, Rome, N. Y.

*Belostoma Americana* Leidy. By D. G. BULKLEY, Albany, N. Y.

*Diognites discolor* Loew, taken on a squash-vine and wrongly supposed by the sender to be injurious to it. By T. E. HAYWARD, Pittsford, N. Y.

Grape vine punctured for oviposition by a flower cricket, *Ecanthus latipennis* Riley. By D. J. HOOVER, Hopkinsville, Ky.

Larval Ant Lions, of species indeterminable, with observations upon their habits. By Geo. W. DUVALL, Annapolis, Md.

*Corydalis cornutus* Linn. By FRANK RICHARDSON, Rutland, Vt.

## SEQUEL OF INSECT ATTACKS OF LAST YEAR.

In my preceding report a brief notice was given of a peculiar attack of the white-marked tussock-moth, *Orgyia leucostigma* (Sm.-Abb.), in girdling the young tips of the twigs of elms in Albany and the vicinity, and causing them to fall to the ground. This form of attack had never been recorded of the insect before, but it was thought possible that it might be continued to some extent in following years.

Nothing of the kind, however, was observed during the past year when the insect again appeared, although diligent watch was kept for its recurrence. Only a comparatively small number of the larvæ made their appearance in Albany, at their accustomed time—not enough to injure, in the slightest appreciable degree, the foliage of any of the shade trees. For several years previous the city had not been so free from its injurious presence. This may have been the result of the severe frosts that occurred as the larvæ were about emerging from the eggs, together with an unusual number of its parasitic enemies the preceding summer, when very few of the larvæ matured, and the cocoons bearing their deposit of eggs (showing completed transformations) were quite exceptional.

As a contribution to the life-history of the species, it may be noted, that on July 5, 1884, larvæ were seen spinning their cocoons upon the trunks of maples in Washington Park, Albany, together with newly-made cocoons, some containing unchanged larvæ and others the pupæ. On the 16th July, females had emerged and deposited eggs, while a larva was seen still feeding. On the 21st, a number of cocoons were collected in which the larvæ were found to have been destroyed by a parasitic *Tachina*.

At Philadelphia, Pa., on September 8, a second brood of the insect was observed, in female moths and egg-deposits, and larvæ constructing their cocoons.

In the notice of the chinch-bug, *Blissus leucopterus*, in my report for 1883, it is stated: "The re-appearance of the insect the coming season will be watched with much interest, as a test of the efficacy of the partial efforts put forth for its destruction."

The insect has not re-appeared, in northern New York, to the extent of committing serious injury. In localities where it had abounded the preceding year, and the land had not been plowed, its presence, in hibernated individuals, was observed soon after the snow had gone. No further damage from it was reported to me, nor could I learn of any through careful inquiry, except in one instance where no attention had been paid to the recommendation of thorough autumn plowing. Here a piece of wheat of several acres in extent was attacked by it and considerably injured.

Apparently, the increase of this dreaded pest in northern New York, at the present time, has been effectually checked.

For the details of my studies and investigations during the year, I beg leave to refer to my regular report, much of which is in MS., which will be hereafter presented to your honorable Board.

Respectfully submitted,

J. A. LINTNER.



## REPORT OF THE BOTANIST.

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*To the Honorable the Board of Regents of the University of the State of New York :*

GENTLEMEN — I have the honor to communicate to you the following statement of the work of the Botanist during the past year :

The investigation of our State flora and the collection and preparation of specimens to properly represent it in the State Herbarium, a work which had been partly interrupted for two years, has been fully renewed and actively prosecuted during the collecting season. Specimens were collected in the counties of Essex, Warren, Fulton, Lewis, Saratoga, Albany and Rensselaer. Of the collected specimens, those representing one hundred and ninety-two species have been prepared, mounted and added to the Herbarium. One hundred and sixteen of these, of which a considerable number are species of fungi not before published, were not previously represented therein. The remainder are species now more completely and satisfactorily illustrated in their different forms and varieties or by more perfect specimens.

Specimens of about one hundred and forty species of plants, mostly fungi, have been contributed by various botanists and correspondents. Of these there are two species of this State new to the Herbarium and not among my collections of the past season. These added to the number already given make a total of one hundred and eighteen added species. A list of their names is marked A. Also a list of contributors and their respective contributions is given and marked B.

Notices of plants not before reported, together with a record of the localities where they were found, also descriptions of such as are deemed new species are in a part of the report marked C. These descriptions, in nearly all cases, have been drawn up with the fresh plant before me. The microscope has been taken with me on my collecting trips, and the microscopical details studied at the time of collecting, in order to insure greater accuracy.

A record of observations on species not new to our flora has been made and is marked D. It contains remarks upon any matters of interest in connection with the variation, distribution, locality or habitat of the species.

A descriptive manual of our Hymenomycetous or fleshy fungi, among which are the mushrooms and mushroom-like Agarics, is greatly needed. The number of those desirous of becoming acquainted with our native species of these plants is constantly increasing, but a proper and convenient manual for their study and identification is wanting. Accidents from the use of poisonous kinds for food, by those, who, ignorant of the true characters of the species, have mistaken them for the edible mushroom occur from time to time. These accidents might readily be avoided by a better and more common acquaintance with the characteristic features of our edible species and their less valuable associates. As a step in this direction monographs of the different genera represented in our

flora were commenced in the thirty-third report and continued in subsequent ones. For the present report a monograph has been prepared of our species of *Lactarius*, or milky-juice fungi, and also one of the genus (subgenus of Fries) *Pluteus*.

The genus *Lactarius* is a large one, at present represented in our State by forty species. Some of these rank as edible, others as poisonous. While the genus as such is easily recognized and accurately separated from all other genera, some of the species that compose it approach each other so closely and vary so considerably that without clear and explicit descriptions they are liable to be confused and their discrimination unsatisfactory. In this monograph it has been the design to make the specific descriptions so complete and at the same time to give such prominence to the distinguishing characters, that no difficulty need be experienced in the identification of our species. The spore characters are also given, a part of the description that is sometimes of great importance, and yet one that has generally been omitted by authors. A synoptical table has been prepared, by means of which, with good fresh specimens, it is believed, the name of any species described in the monograph may be easily and quickly ascertained. These monographs constitute a part of the report marked E. The revision of our specimens of Sphæriaceous fungi, which was commenced last year, has been continued and completed. This revision, as was explained in my preceding report, was necessary in order to bring the arrangement and nomenclature of our species into harmony with the recent Saccardoan system, which, from present indications, is destined to supersede the old Friesian system.

It is desirable, not only that our Agarics and other fleshy Hymenomycetous fungi, which so generally shrivel and change color in drying, should be illustrated by sketches of the fresh plant colored according to nature, but also that magnified drawings of the microscopic characters of the smaller and minute fungi should be made and accompany the specimens in the Herbarium. A considerable number of such sketches were made the past season, at the time the specimens were collected. From these I have prepared three plates of figures designed to illustrate, as far as possible, the characters of the new species described in the following pages

Thanks are hereby rendered to those botanists who have kindly aided me in the prosecution of my labors, both by the contribution of specimens and of information.

Most respectfully submitted,  
CHAS. H. PECK.

ALBANY, *December 31, 1884.*

## A.

## PLANTS ADDED TO THE HERBARIUM.

*New to the Herbarium.*

- Ipomæa purpurea*, *L.*  
*Populus dilatata*, *L.*  
*Listera convallarioides*, *Hook.*  
*Molinia cærulea*, *Manch.*  
*Festuca rubra*, *L.*  
*Agaricus clypeolarius*, *Bull.*  
*A. terræolens*, *Pk.*  
*A. vexans*, *Pk.*  
*A. purpureofuscus*, *Pk.*  
*A. immaculatus*, *Pk.*  
*A. discopus*, *Lev.*  
*A. hiemalis*, *Osbeck.*  
*A. scyphoides*, *Fr.*  
*A. jubatus*, *Fr.*  
*A. unitinctus*, *Pk.*  
*A. atrides*, *Lasch.*  
*A. comosus* v. *albus*, *Pk.*  
*A. villosus*, *Fr.*  
*A. umboninotus*, *Pk.*  
*A. maritimoides*, *Pk.*  
*A. comatellus*, *Pk.*  
*A. subexilis*, *Pk.*  
*A. sordidulus*, *Pk.*  
*A. parvifructus*, *Pk.*  
*A. cærulipes*, *Pk.*  
*A. madeodiscus*, *Pk.*  
*Coprinus lagopus*, *Fr.*  
*Cortinarius aureifolius*, *Pk.*  
*C. multiformis*, *Fr.*  
*C. decoloratus*, *Fr.*  
*Hygrophorus purpurascens*, *Fr.*  
*Lactarius varius*, *Pk.*  
*L. hysginus*, *Fr.*  
*L. paludinellus*, *Pk.*  
*Russula basifurcata*, *Pk.*  
*Lentinus suavisissimus*, *Fr.*  
*Boletus sulphureus*, *Fr.*  
*B. versipellis*, *Fr.*  
*Polyporus abortivus*, *Pk.*  
*P. epileucus*, *Fr.*  
*P. crispellus*, *Pk.*  
*P. lætificus*, *Pk.*  
*P. fimbriatellus*, *Pk.*  
*P. ornatus*, *Pk.*  
*P. odoratus*, *Pk.*  
*P. subacidus*, *Pk.*  
*P. griseoalbus*, *Pk.*  
*Merulius fugax*, *Fr.*  
*M. aurantiacus*, *Pk.*  
*Geaster striatus*, *DC.*  
*Coniophyrium valsoideum*, *Pk.*  
*Phoma Phytolacæ*, *B. & C.*  
*P. elevatum*, *Pk.*  
*P. Pruni*, *Pk.*  
*P. albifructum*, *Pk.*  
*Sphæropsis alnicola*, *Oke.*  
*Sphæropsis ribicola*, *C. & E.*  
*Diplodia pinea*, *Kz.*  
*Sphærographium hystricinum*, *Sacc.*  
*S. lantanoidis*, *Pk.*  
*Appendicularia entomophila*, *Pk.*  
*Gelatinosporium fulvum*, *Pk.*  
*Phyllosticta Podophylli*, *West.*  
*P. Labruscæ*, *Thum.*  
*P. Epigææ*, *Pk.*  
*P. lantanoidis*, *Pk.*  
*Ascochyta Cassandræ*, *Pk.*  
*A. colorata*, *Pk.*  
*Marsonia Quercus*, *Pk.*  
*Pestalozzia monochætoidea*, *S. & E.*  
*Stagonospora Smilacis*, *Sacc.*  
*Gleosporium Salicis*, *Wint.*  
*G. Ribis*, *Cast.*  
*Septoria alnicola*, *Oke.*  
*S. Ribis*, *Desm.*  
*S. Lysimachicæ*, *West.*  
*S. Dentariæ*, *Pk.*  
*S. Dalibardæ*, *Pk.*  
*S. Diervillæ*, *Pk.*  
*S. fumosa*, *Pk.*  
*S. punicea*, *Pk.*  
*S. Trillii*, *Pk.*  
*Rhabdospora subgrisea*, *Pk.*  
*Hadrotrichum lineare*, *Pk.*  
*Ramularia multiplex*, *Pk.*  
*R. Pruni*, *Pk.*  
*R. Diervillæ*, *Pk.*  
*R. Oxalidis*, *Farl.*  
*Cylindrosporium veratrinum*, *S. & W.*  
*Ovularia moniloides*, *E. & M.*  
*Peronospora Arthuri*, *Farl.*  
*P. Halstedii*, *Farl.*  
*P. Potentillæ*, *DeBy.*  
*Entyloma Saniculæ*, *Pk.*  
*Cercospora Violæ*, *Sacc.*  
*C. Majanthemi*, *Fekl.*  
*C. Cephalanthi*, *E. & K.*  
*C. Comari*, *Pk.*  
*Cenangium balsameum*, *Pk.*  
*Sphærotheca pannosa*, *Lev.*  
*Asterina nuda*, *Pk.*  
*Capnodium Citri*, *B. & D.*  
*Valsa Friesii*, *Fekl.*  
*V. cornina*, *Pk.*  
*V. leucostomoides*, *Pk.*  
*V. opulifoliæ*, *Pk.*  
*Diatrypella Frostii*, *Pk.*  
*Sphærella conigena*, *Pk.*  
*Didymosphæria Typhæ*, *Pk.*  
*Venturia Cassandræ*, *Pk.*  
*Diaporthe Wibbei*, *Nits.*  
*D. cylindrospora*, *Pk.*

Leptosphæria eutypoides, *Pk.*  
*L.* Corallorhizæ, *Pk.*  
*L.* lycopodiicola, *Pk.*  
 Metasphæria Myricæ, *Pk.*

Mazzantia sepium, *S. & P.*  
 Sphærulina sambucina, *Pk.*  
 Cryptospora Caryæ, *Pk.*

*Not New to the Herbarium.*

Ranunculus repens, *L.*  
 Nuphar advena, *Ait.*  
 Caulophyllum thalictroides, *Mx.*  
 Podophyllum peltatum, *L.*  
 Capsella Bursa-pastoris, *Mænch.*  
 Viola pubescens, *Ait.*  
*V.* rostrata, *Pursh.*  
*V.* can. v. sylvestris, *Regel.*  
 Hypericum ellipticum, *Hook.*  
 Acer dasycarpum, *Ehrh.*  
 Geranium maculatum, *L.*  
 Rhus typhina, *L.*  
 Rubus hispidus, *L.*  
 Rosa setigera, *Mx.*  
 Fragaria Virginiana, *Ehrh.*  
 Prunus serotina, *Ehrh.*  
 Aralia hispida, *Mx.*  
*A.* nudicaulis, *L.*  
 Sambucus pubens, *Mx.*  
 Cornus sericea, *L.*  
*C.* stolonifera, *Mx.*  
 Fedia umbilicata, *Mx.*  
 Tussilago Farfara, *L.*  
 Senecio aureus, *L.*  
 Tanacetum vulgare, *L.*  
 Vaccinium Pennsylvanicum, *Lam.*  
 Chiogenes hispidula, *T. & G.*  
 Amarantus blitoides, *Wats.*  
 Quercus palustris, *Du Roi.*  
 Alnus incana, *Willd.*  
*A.* serrulata, *Ait.*  
 Salix fragilis, *L.*  
 Symplocarpus foetidus, *Salisb.*  
 Corallorhiza multiflora, *Nutt.*  
 Uvularia perfoliata, *L.*  
*U.* grandiflora, *Sm.*  
 Trillium grandiflorum, *Salisb.*  
 Juncus marginatus, *Rostk.*  
 Carex stipata, *Muhl.*

Carex grisea, *Wahl.*  
*C.* laxiflora, *Lam.*  
*C.* umbellata, *Schk.*  
 Holcus lanatus, *L.*  
 Agrostis vulgaris, *With.*  
 Glyceria fluitans, *R. Br.*  
*G.* elongata, *Trin.*  
 Danthonia spicata, *Beauv.*  
*D.* compressa, *Aust.*  
 Panicum dichotomum, *L.*  
 Bromus ciliatus, *L.*  
 Aira cæspitosa, *L.*  
 Millium effusum, *L.*  
 Lycopodium complanatum, *L.*  
 Agaricus muscarius, *L.*  
*A.* naucinoides, *Pk.*  
*A.* transmutans, *Pk.*  
*A.* radicans, *Relh.*  
*A.* maculatus, *A. & S.*  
*A.* stipitarius, *Fr.*  
*A.* clavicularis, *Fr.*  
*A.* atrocæruleus, *Fr.*  
*A.* strictior, *Pk.*  
*A.* rhodopolius, *Fr.*  
*A.* præcox, *Pers.*  
*A.* subochraceus, *Pk.*  
*A.* Hypnorum, *Batsch.*  
*A.* Rodmani, *Pk.*  
*A.* arvensis, *Schæff.*  
 Coprinus atramentarius, *Bull.*  
 Cortinarius porphyropus, *A. & S.*  
 Marasmius anomalus, *Pk.*  
*M.* androsaceus, *L.*  
 Panus lævis, *B. & C.*  
 Schizophyllum commune, *Fr.*  
 Boletus Clintonianus, *Pk.*  
 Polyporus lucidus, *Leys.*  
*P.* undosus, *Pk.*

B.

CONTRIBUTORS AND THEIR CONTRIBUTIONS.

Mrs. S. M. Rust, Syracuse, N. Y.

Trillium grandiflorum, *Salisb.*

Mrs. L. L. Goodrich, Syracuse, N. Y.

Trillium grandiflorum, *Salisb.*

Prof. N. L. Britton, New York, N. Y.

Juncus trifidus, *L.*



Prof. O. C. Willis, White Plains, N. Y.

*Ledum latifolium*, *Ait.* *Andromeda polifolia*, *L.*

Prof. W. G. Farlow, Cambridge, Mass.

*Phoma Amelanchieris*, *Farl.* *Ramularia Oxalidis*, *Farl.*  
*Coleosporium Senecionis*, *Wint.* *Peronospora Halstedii*, *Farl.*  
*Cylindrosporium Gei*, *Farl.* *Stictis Tsugæ*, *Farl.*  
*Entyloma Lobeliæ*, *Farl.* *Phyllachora Wittrockii*, *Sacc.*

Rev. J. L. Zabriskie, Nyack, N. Y.

*Rhus typhina*, *L.* *Juncus marginatus*, *Rostk.*  
*Quercus palustris*, *Du Roi.* *Appendicularia entomophila*, *Pk.*

Harold Wingate, Philadelphia, Pa.

*Chondrioderma Michelii*, *Lib.* v *sessile*, *Rostk.*

Geo. A. Rex, M. D., Philadelphia, Pa.

*Trichia chrysosperma*, *Bull.* *Physarella mirabilis*, *Pk.*  
*Comatriza longa*, *Pk.*

E. A. Burt, Albany, N. Y.

*Hydrangea arborescens*, *L.* *Carex Houghtonii*, *Torr.*  
*Carex stram* v. *festucacea*, *Gr.*

H. C. Gordinier, Troy, N. Y.

*Aster ptarmicoides*, *T. & G.* *Trillium grandiflorum*, *Salish.*  
*Fedia radiata*, *Mx.* *Liparis Læselii*, *Rich.*

Romeyn B. Hough, Lowville, N. Y.

*Listera convallarioides*, *Hook.* *Habenaria obtusata*, *Rich.*  
*Liparis Læselii*, *Rich.* *H. rotundifolia*, *Rich.*

D. Byron Waite, Springwater, N. Y.

*Castilleia coccinea*, *Spreng.*

J. D. Greenslete, Broadalbin, N. Y.

*Polygonatum biflorum*, *Ell.* *Orontium aquaticum*, *L.*

H. Andrews, Albany, N. Y.

*Potamogeton Robbinsii*, *Oakes.*

John D. Parsons, Albany, N. Y.

*Lycoperdon giganteum*, *Batsch.*

D. A. A. Nichols, Dunkirk, N. Y.

*Uncinula spiralis*, *B & C.*

T. F. Allen, M. D., New York, N. Y.

*Nitella tenuissima*, *Kutz.* *Tolypella fimbriata*, *Allen.*  
*N. glomerulifera*, *A. Br.* *T. intertexta*, *Allen.*  
*N. opaca*, *Ag.* *Chara sejuncta*, *A. Br.*  
*N. minuta*, *Allen.* *C. hydropitys*, *A. Br.*  
*Tolypella comosa*, *Allen.* *C. gymnopus*, *A. Br.*

Prof. L. Lesquereux, Columbus, O.

\* *Polyporus lucidus*, *Leys. ?* \* *Polyporus applanatus*, *Fr. ?*

\* These are monstrous growths from abandoned coal mines, and therefore their specific identification is uncertain.

## F. S. Earle, Cobden, Ill.

Septoria Bromi, *Sacc.*  
 S. Pentstemonis, *E. & E.*  
 S. asciculosa, *E. & E.*  
 S. podophyllina, *Pk.*  
 Gloeosporium Potentillæ, *Ouds.*  
 Phyllosticta Fraxini, *E. & W.*  
 P. pyrorum, *Cke.*  
 Sporidesmium Fumago, *Cke.*  
 Æcidium Epilobii, *DC.*

Cercospora sordida, *Sacc.*  
 C. Persicæ, *Sacc.*  
 C. fuscovirens, *Sacc.*  
 Entyloma Lobeliæ, *Farl.*  
 E. Physalidis, *Wint.*  
 Peronospora Arthuri, *Farl.*  
 Microsphaera Platani, *Howe.*  
 Phyllactinia suffulta, *Sacc.*  
 Dimerosporium pulchrum, *Sacc.*

## Hon. G. W. Clinton, Albany, N. Y.

Lentinus lepideus, *Fr.*  
 Rhabdospora subgrisea, *Pk.*

Polyporus squamosus, *Fr.*  
 P. applanatus, *Fr.*

## J. B. Ellis, Newfield, N. J.

Polyporus oblectans, *Berk.*  
 Irpex coriaceus, *B. & R.*  
 Phlebia zonata, *B. & C.*  
 Thelephora caespitulans, *Schw.*  
 Stereum subpileatum, *B. & C.*  
 Hymenochaete scabriseta, *Cke.*  
 Peniophora flavido-alba, *Cke.*  
 Physarella mirabilis, *Pk.*  
 Septoria Helianthi, *E. & K.*  
 S. Speculariæ, *B. & C.*  
 Pestalozzia Myricæ, *E. & M.*  
 Pestalozziella subsessilis, *S. & E.*  
 Stilbospora fenestrata, *E. & E.*  
 Puccinia nigrescens, *Pk.*  
 P. splendens, *Vize.*  
 P. mirabilissima, *Pk.*  
 P. asperior, *E. & E.*  
 P. Angelicæ, *E. & E.*  
 Triphragmium echinatum, *Lev.*  
 Ustilago Vilfæ, *Wint.*  
 U. lineata, *Cke.*  
 Sorosporium Ellisi, *Wint.*  
 Peridermium orientale, *Cke.*  
 Æcidium porosum, *Pk.*  
 Æ. Xanthoxyli, *Pk.*

Æcidium Æsculi, *E. & E.*  
 Æ. Collinsiae, *E. & E.*  
 Æ. Ceanothi, *E. & E.*  
 Ramularia Celastri, *E. & M.*  
 Peronospora Sicyicola, *Trel.*  
 P. Halstedii, *Farl.*  
 Cenangium asterinosporum, *E. & E.*  
 Pecillum Americanum, *Cke.*  
 Pilacre Petersii, *B. & Br.*  
 Saccardia Martini, *E. & S.*  
 Valsa sordida, *Nits.*  
 V. cercophora, *Ell.*  
 Cucurbitaria Coremæ, *E. & E.*  
 Diatrype deusta, *E. & M.*  
 Didymosphaeria cupula, *Ell.*  
 Trabutia quercina, *S. & R.*  
 Hypoxylon pruinatum, *Kl.*  
 Diaporthe Conradii, *Ell.*  
 D. densissima, *Ell.*  
 Venturia pezizoides, *S. & E.*  
 Massaria sudans, *B. & C.*  
 Leptosphaeria Xerophyli, *Ell.*  
 Linospora ferruginea, *E. & M.*  
 Microthyrium Juniperi, *Desm.*

## H. W. Harkness, M. D., San Francisco, Cal.

Hymenula aciculosa, *E. & H.*  
 Octaviania rosea, *Hark.*  
 Gautiera monticola, *Hark.*  
 Splanchnomyces Behrii, *Hark.*  
 Septoria Hosackiæ, *Hark.*  
 S. Lupini, *Hark.*  
 Marsonia Neillii, *Hark.*  
 Gloeosporium Pteridis, *Hark.*  
 Septoglœum Fraxini, *Hark.*  
 S. maculans, *Hark.*  
 S. Nuttallii, *Hark.*  
 Harknessia longipes, *Hark.*  
 Pestalozzia corynoidea, *Hark.*  
 P. anomala, *Hark.*

Pestalozzia Moorei, *Hark.*  
 Puccinia anachoreta, *Hark.*  
 P. evadens, *Hark.*  
 P. variolans, *Hark.*  
 P. melanconioides, *E. & H.*  
 P. digitata, *E. & H.*  
 Uromyces Nevadensis, *Hark.*  
 U. Spragueæ, *Hark.*  
 U. Eriogoni, *E. & H.*  
 Morthiera Mespili, *Fekl.*  
 Melanconium magnum, *Berk.*  
 Rhytisma Andromedæ, *Fr.*  
 Lophodermium petiolicolum, *Fekl.*

## Aug. F. Færste, Granville, Ohio,

Secotium Warnei, *Pk.*

## C.

## PLANTS NOT BEFORE REPORTED.

*Ipomœa purpurea, Lam.*

Along railroads and in waste places. West Albany. It is commonly cultivated as an ornamental plant and for the sake of shade. It continues to reproduce itself from year to year and spreads readily by seed.

*Populus dilatata, Ait.*

Sandy soil beyond West Albany. This tree, formerly introduced for ornament, produces only staminate flowers with us, and therefore does not propagate itself by seed. But it spreads freely by its roots, and having once obtained a foothold it does not often yield its ground unless compelled to do so by man. In the station whence our specimens were taken, there is a grove of thrifty young trees at a considerable distance from any dwelling, but they are probably the descendants of trees planted there many years ago, perhaps in front of some dwelling, all traces of which have long since disappeared.

*Listera convallarioides, Hook.*

Turin, Lewis county. *Romeyn B. Hough.* The three North American species of this genus have now all been found in our State, but they are all rare with us.

*Festuca rubra, L.*

Wet ground. Caroga, Fulton county. July. This was formerly considered a variety of *F. ovina*, sheep's fescue, but it is now generally classed as a distinct species. It is said to be indigenous about Lake Superior and northward, but has probably been introduced in the locality here mentioned. It was found in a clearing recently made, and could not have occupied the station many years. According to Professor F. L. Scribner, our specimens correspond to the variety *fallax*, which is common in Europe.

*Molinia cærulea, Mærch.*

Wet ground. Caroga. July. A grass introduced from Europe, and perhaps not yet fully established here. It was found growing with the preceding species, and with several of our native grasses, and was apparently well able to take care of itself. It forms dense tufts, and has an erect, somewhat rigid appearance.

*Tolypella comosa, Allen.*

Seneca lake. *T. F. Allen.*

*Tolypella fimbriata, Allen.*

Lake Ontario. *Allen.*

**Tolypella intertexta, Allen.**

Seneca lake. Allen.

**Chara hydropitys, A. Br. v. genuina, A. Br.**

Saranac river. Aug. Paul Allen.

**Agaricus clypeolarius, Bull.**

Copses and thin woods. Karner. Oct. This species was reported in the Twenty-third Museum report, but erroneously, as the specimens were afterward found to belong to *A. metulæsporus*, a species which closely resembles this in external characters. The specimens now under consideration are believed to belong to the true *A. clypeolarius*. The spores in them are much smaller than those of *A. metulæsporus*. In many cases the spores furnish important characters for distinguishing species of Agarics, and it is to be regretted that European mycologists have so generally neglected them in their descriptions.

**Agaricus (Tricholoma) terræolens, n. sp.**

Pileus thin, convex or nearly plane, slightly silky fibrillose, whitish with a brownish or grayish brown slightly prominent disk, lamellæ sub-distant, emarginate, white, stem equal, slightly silky, shining, stuffed or hollow, white; spores subglobose or broadly elliptical, .00025 to .0003 in. long, .0002 to .00025 broad; flesh white, taste and odor strong, unpleasant and earthy.

Plant 1 to 2 inches high, pileus 10 to 15 lines broad, stem about 2 lines thick.

Under ground hemlock, *Taxus Canadensis*. South Ballston, Saratoga county. Sept.

The species belongs to the section SERICELLA, and is closely related to *A. inamœnus*, from which it is separated by its smaller size, less distant lamellæ, stuffed or hollow stem and different odor. Nor do I find the stem radicating or the disk tinged with yellow as in that species. Fries compares the odor of *A. inamœnus* to that of *Geranium Robertianum*, but the odor of our plant is decidedly earthy, resembling that of vegetable mold or mossy rocks. Its taste is similar to its odor, and remains in the mouth and throat a long time.

**Agaricus (Mycena) immaculatus, n. sp.**

Pileus membranaceous, conical or sub-hemispherical, glabrous, slightly striate on the margin, pure white; lamellæ moderately broad, distant, adnate or uncinately-decurrent, white; stem slender, pellucid, white, glabrous, generally villose strigose at the base, and slightly thickened at the apex; spores oblong or cylindrical, .0003 to .00035 in. long, .00012 broad.

Plant 8 to 18 lines high, pileus 2 to 4 lines high and broad, stem scarcely .5 line thick.

Among moss and fallen leaves and on naked ground. Adirondack mountains. June.

The species belongs to the section ADONIDEÆ and is related in size



and color to *A. lacteus*, from which I have separated it on account of the decurrent toothed lamellæ and the longer spores. The striations of the pileus are also more distinctly visible in our plant when dried than they are when it is fresh.

### *Agaricus (Mycena) vexans*, *n. sp.*

Pileus membranous, conical sub-campanulate or convex, rather distantly striate, blackish-brown, sometimes slightly pruinose; lamellæ subdistant, ascending, adnate or uncinately adnate, slightly venose-connected, at first white, becoming grayish or smoky white, the edge paler; stem slender, rather tenacious, hollow, glabrous, colored like the pileus, somewhat floccose-villose at the base; spores sub-elliptical, .0003 to .00035 in. long, .0002 to .00025 broad; odor slight, alkaline.

Plant scattered or gregarious, not caespitose, 2 to 2.5 inches high, pileus 4 to 6 lines high and broad, stem scarcely 1 line thick.

Ground in thin woods and open places. Adirondack mountains. June.

I have placed this species in the section FILIPEDES, although the slightly venose interspaces ally it to the RIGIDIPEDES, and the alkaline odor shows a relationship to the FRAGILIPEDES. It appears to be closely related to *A. uranius*, from which it may be distinguished by its larger size, different color and pileus not expallent. The pileus is not hygrophanous, and is striate even in the dried state. The lamellæ in the dried plants are brownish, with the edge nearly white.

### *Agaricus (Mycena) purpureofuscus*, *n. sp.*

Pileus membranous, campanulate or convex, obtuse, glabrous, striate, purplish-brown; lamellæ ascending, lanceolate, subdistant, adnate, white or whitish, purplish-brown on the edge; stem slender, even, hollow, glabrous, with white hairs at the base, colored like the pileus or a little paler; spores sub-globose or broadly elliptical, .00025 to .0003 in. long, .00025 broad.

Plant 1 to 3 inches high, pileus 4 to 8 lines broad, stem scarcely 1 line thick.

Mossy prostrate trunks of spruce trees in woods. Caroga. July.

This species belongs to the section CALODONTES, and is so closely related to *A. rubromarginatus*, that it is with some hesitation that I have separated it. Because of its darker color and the absence of the hygrophanous character of that species, it has seemed best to keep it distinct. Its even, not striated, stem forbids its reference to *A. atromarginatus*.

### *Agaricus discopus*, *Lev.*

Base of dead fern stems. Sandlake and Karner. Sept. and Oct.

The bulb at the base of the stem in our specimens is not as distinct as in the published figures of the species, but in other respects the specific characters are present.

### *Agaricus hiemalis*, *Osbeck.*

Prostrate trunk of spruce, *Abies nigra*. Adirondack mountains. June.

The specimens agree very well with the description of the species, but they appear to have occurred out of season.

***Agaricus scyphoides*, Fr.**

Bare soil and on decaying wood. South Ballston. Aug.

***Agaricus jubatus*, Fr.**

Damp ground in thin woods. West Albany. Sept.

The specimens were few in number and not fully developed. The pileus was conical, and clothed with a short, close, velvety pubescence, and the stem was solid. In these respects the specimens do not agree well with the description of the species, although bearing a striking resemblance to the figure of the species in *Mycological Illustrations*. We have, therefore, for the present, referred them to this species.

***Agaricus (Clitopilus) unitinctus*, n. sp.**

Pileus thin, flexible, convex or nearly plane, centrally depressed, glabrous, subshining, sometimes concentrically rivulose, grayish-brown; lamellæ narrow, moderately close, adnate or slightly decurrent, colored like the pileus; stem slender, straight or flexuous, subtenacious, equal, stuffed, slightly pruinose, grayish-brown, with a close, white mycelioid tomentum at the base, and white, root-like fibres of mycelium penetrating the soil; spores elliptical, .0003 in. long, .0002 broad; flesh whitish or grayish-white, odor almost none, taste mild.

Plant 1 to 2 inches high, pileus 6 to 12 lines broad, stem about 1 line thick.

Thin pine woods. Karner. Oct.

The species is apparently related to *A. cicatrisatus*.

***Agaricus atrides*, Lasch.**

Damp ground in woods. Caroga. July.

This species differs from *A. serrulatus* by its decurrent lamellæ, and from *A. Watsoni* by its darker color and blackish denticulations on the edge of the lamellæ.

***Agaricus villosus*, Fr.**

Prostrate trunks of poplars. West Albany. Aug.

Our specimens are pale-yellow or buff, becoming darker with age. In other respects they correspond to the characters of the species.

***Agaricus comosus*, Fr., var. *albus*, Pk.**

Trunks of horsechestnut. Albany. Oct.

Two specimens only were found. These were white, becoming tinged with yellow in drying. The typical form of the species is tawny. From *A. destruens*, with which our specimens agree more closely in color, the viscosity of the pileus will separate them. The spores are ferruginous, .0003 to .00035 in. long, .0002 to .00025 broad.

### **Agaricus (Inocybe) umboninotus, n. sp.**

Pileus broadly campanulate or expanded, prominently umbonate, rimose-fibrillose, dark-brown; lamellæ at first whitish, then ferruginous-brown; stem equal or slightly thickened at the base, solid, fibrillose, paler than the pileus, pruinose at the apex; spores nodulose, .0003 to .00035 in. broad.

Plant 1 5 to 2 inches high, pileus 6 to 10 lines broad, stem 1 to 2 lines thick.

Mossy ground in woods. Caroga. July.

Its spores separate it from *A. rimosus*, and its prominent umbo from *A. asterosporus*.

### **Agaricus (Inocybe) maritimoides, n. sp.**

Pileus subconical or convex, dry, obtuse, densely squamulose with small erect or squamose-fibrillose scales, fibrillose on the margin, dark-brown; lamellæ close, rounded behind and adnexed, ventricose, whitish, becoming brownish-ochraceous; stem equal, solid, fibrillose, paler than the pileus; spores irregular, angular, brownish-ochraceous, .0003 to .00035 in. long, .0002 to .00025 broad.

Plant about 1 inch high, pileus 6 to 12 lines broad, stem 2 lines thick.

Thin woods. Karner. Oct.

Apparently related to *A. maritimus*, but not hygrophanous. The spores are slightly angular, resembling in shape those of species of *Entoloma* and other *Hyporrhodii*, but are scarcely nodulose.

### **Agaricus (Inocybe) comatellus, n. sp.**

Plate 2, figs. 5-8.

Pileus submembranous, convex or expanded, clothed with whitish or gray hairs, fimbriate on the margin; lamellæ subdistant, adnexed, pale-tawny; stem equal, solid, flexuous, pallid or reddish-brown, a little darker above, slightly mealy or pruinose-hairy, with a white mycelium at the base, spores subelliptical, even, .0003 to .0004 in. long, .0002 to .00025 broad.

Plant 6 to 12 lines high, pileus 2 to 4 lines broad, stem scarcely half a line thick.

Sticks and bark buried under fallen leaves. Caroga. July.

A small species remarkable for the hairy covering of the pileus. This is sufficiently dense to give to the pileus a whitish or pale-gray appearance. The species is apparently related to *A. tricholoma*, A. & S., and *A. strigiceps*, Fr.

### **Agaricus (Inocybe) subexilis, n. sp.**

Pileus thin, convex or subcampanulate, then expanded, umbonate, fibrillose on the margin, at first pale chestnut color, then yellowish or subochraceous, lamellæ narrow, rather close, rounded behind, subventricose, whitish, becoming dull-ochraceous; stem equal, solid, flexuous, minutely pruinose, finely striate under a lens, pinkish, then yellowish; spores subglobose, nodulose, about .0003 in. in diameter.

Plant 8 to 12 lines high, pileus 3 to 5 lines broad; stem about .5 line thick.

Damp, mossy ground, in woods. Caroga. July.

A very small species, related to *A. paludinellus*, from which it differs in its smaller size, shape of the spores and brighter colors of the pileus.

***Agaricus (Hebeloma) sordidulus, n. sp.***

Pileus thin, rather firm, convex, viscid when moist, dingy brownish-red or tawny-brown, paler or whitish on the margin, flesh white, with a radish-like odor; lamellæ broad, close, rounded behind, slightly annexed, pallid, then brownish-ochraceous; stem short, equal, stuffed or hollow, slightly fibrillose, white, pruinose at the apex; spores subelliptical, .0005 to .00055 in. long, .00025 to .00028 broad.

Sandy soil, in open places. Karner. Oct.

Plant about 1 inch high, pileus 8 to 15 lines broad, stem 1.5 to 2 lines thick.

A small species, belonging to the section PUSILLI.

***Agaricus (Hebeloma) parvifructus, n. sp.***

Pileus convex, then expanded, slightly viscid, dingy-white, becoming grayish-brown or pale-chestnut colored with age, often paler on the margin; lamellæ broad, moderately close, slightly emarginate, at first white, then brownish-ochraceous; stem equal, silky-fibrillose, solid, whitish, stained with ferruginose or brown toward the base, pruinose and substriate at the apex; spores brownish-ochraceous, .00025 to .00028 in. long, .00016 to .00018 broad; veil white, arachnoid.

Plant three to four inches high, pileus two to three inches broad, stem three to five lines thick.

Sandy soil in pine woods. West Albany. Oct.

The spores of this plant are smaller than usual in species of this subgenus, and this character has suggested the specific name. The lamellæ are at first concealed by the copious, webby filaments of the veil. The species belongs to the section INDUSIATI.

***Agaricus (Hypholoma) madeodiscus, n. sp.***

Pileus thin, convex, becoming nearly plane, hygrophanous, pale chestnut or reddish brown when moist, grayish-tawny or pale-ochraceous and rugose on the disk when dry, the margin, when young, slightly silky-fibrillose; lamellæ close, slightly emarginate, whitish, then brown; stem equal or slightly thickened at the base, hollow, white, sub-silky; spores brown, elliptical, .00035 to .0004 in. long, .00025 broad.

Plant 2 to 3 inches high, pileus 1 to 2 inches broad, stem 2 to 3 lines thick.

Decaying wood in wet places. Adirondack mountains. June.

This species differs from *A. appendiculatus*, its nearest ally, by its larger size, less rugose pileus and larger spores. Also, it is unlike that species in parting with the moisture of the margin of the pileus first, the disk retaining it some time, a character which is suggestive of the specific name. I have not seen the plant growing in tufts. The veil is whitish and very delicate, and at first conceals the lamellæ from view. It at length adheres in fragments to the margin of the pileus.



**Agaricus (Psilocybe) cærulipes, n. sp.**

Pileus thin, subcampanulate, then convex and obtuse or obtusely umbonate, glabrous, hygrophanous, slightly viscid, watery brown and striatulate on the margin when moist, yellowish or subochraceous when dry, the disk sometimes brownish; lamellæ at first ascending, close, adnate, grayish-tawny, becoming ferruginous-brown, whitish on the edge; stem slender, equal, flexuous, tenacious, hollow or containing a separable pith, slightly fibrillose, pruinose at the apex, bluish, sometimes whitish at the apex; spores elliptical, .0003 to .0004 in. long, .00016 to .0002 broad.

Plant single or cæspitose, 1 to 1.5 in. high, pileus 5 to 10 lines broad, stem scarcely 1 line thick.

Decaying wood. South Ballston. Aug.

The species is easily recognized by the peculiar blue color of the stem. Sometimes the pileus also assumes a blue color where bruised.

**Corpinus lagopus, Fr.**

Decaying wood and vegetable mold in woods. South Ballston. Sept.

**Cortinarius multiformis, Fr.**

Pine woods. Karner. Oct.

**Cortinarius decoloratus, Fr.**

Pine woods. Karner. Oct.

**Cortinarius (Dermocybe) aureifolius, n. sp.**

Pileus convex, then plane or slightly depressed, densely fibrillose-tomentose, sometimes slightly squamulose, especially on the disk, cinnamon-brown; lamellæ rather broad, moderately close, subventricose, rounded behind, adnexed, yellow, becoming yellowish-cinnamon, stem short, solid, equal, fibrillose, yellow, brownish within; spores oblong, .00045 to .0005 in. long, .00016 to .0002 broad; flesh of the pileus yellow or pallid, odor like that of radishes.

Plant gregarious, 1 to 1.5 in. high, pileus 8 to 15 lines broad, stem 2 to 3 lines thick.

Sandy soil in thin pine woods. Karner. Oct.

The species resembles *C. cinnamomeus* in color, but its short stem, longer spores and different habit easily distinguish it. Its general appearance is similar to that of some species of *Inocybe*.

**Hygrophorus purpurascens, Fr.**

Sandy soil under pine trees. Karner. Oct.

In our specimens the pileus is fibrillose rather than squamulose, the stem is slightly mealy at the apex, not roughened with purplish squamules, and there is a webby veil which, in the young plant, conceals the lamellæ and forms a slight but evanescent annulus. Should these differences between our specimens and the species to which we have referred them be constant, it may be necessary to separate our plant as a distinct species.

**Lactarius hysginus, Fr.**

Mossy ground in woods and swamps. Caroga and Sandlake. July and Aug.

**Lactarius varius, Pk.**

Sandy soil. West Albany and Karner. Sept. and Oct.

**Lactarius paludinellus, Pk.**

Sphagnous marshes. Sandlake. Aug. For the descriptions of this and the preceding species of *Lactarius* see the article on the New York species of *Lactarius*.

**Russula basifurcata, n. sp.**

Pileus firm, convex, umbilicate, becoming somewhat funnel form, glabrous, slightly viscid when moist, the thin pellicle scarcely separable except on the margin, dingy-white, sometimes tinged with yellow or reddish-yellow, the margin nearly even; lamellæ rather close, narrowed toward the base, adnate or slightly emarginate, many of them forked near the base, a few short ones intermingled, white becoming yellowish; stem firm, solid, becoming spongy within, white; spores elliptical, pale yellow, uninucleate or shining, .00035 in. long, .00025 broad; flesh white, taste mild, then bitterish.

Pileus 2 to 3 inches broad, stem 8 to 12 lines long, 5 to 6 lines thick.

Dry hard ground in paths and wood roads. Caroga. July.

This species belongs to the section FRAGILES, but in some respects it closely resembles pale forms of *R. furcata*, from which it is separated by the absence of any silky micor and by the yellowish color and elliptical shape of the spores and by the yellowish hue of the lamellæ.

**Lentinus suavissimus, Fr.**

Dead willows, *Salix discolor*. Caroga. July. The strong but agreeable odor, resembling that of melilot, and the lamellæ crisped and anastomosing at the base readily distinguish this species, which is apparently very rare with us.

**Boletus sulphureus, Fr.**

Thin woods. Caroga. July.

But a single specimen was found and this does not fully agree with the description, but it is for the present placed here.

**Boletus versipellis, Fr.**

Sandy soil. West Albany and Karner. Oct.

This species so closely resembles some forms of *B. scaber* that it is not surprising that Persoon regarded it as a variety of that species. The reddish color, dry pileus and appendiculate margin are the most available distinguishing characters of the species. It is apparently quite rare.

**Polyporus abortivus, Pk.**

Buried sticks and decomposing vegetable matter. South Ballston. Aug. and Sept.

This species is remarkable for the abundance of its spores. It is so deformed and apparently imperfect in its development that such fruitfulness would scarcely be expected. The pileus, when sufficiently developed to be recognizable, is of a reddish or alutaceous color.

**Polyporus epileucus, Fr. var. candidus, Pk.**

Decaying prostrate trunks of hemlock, *Abies canadensis*. Osceola, Lewis county. Aug.

Pileus snow-white, scrupose, scarcely villose, somewhat fibrous within and slightly zonate toward the margin; pores plane or convex.

Our specimens, while not agreeing fully with the published characters of *P. epileucus*, approximate so closely to them that we have characterized this form as a variety.

**Polyporus crispellus, n. sp.**

Pileus thin, fleshy, laterally elongated, undulate or subcrispate on the margin, radiate-rugose, subglabrous, whitish varied with brownish zones, flesh white, marked by a few linear hyaline or slightly colored zones; pores short, about equal in length to the thickness of the pileus, minute, subrotund, white, the thin dissepiments more or less dentate.

Pileus 8 to 12 lines broad, extending laterally 1 to 4 inches.

Prostrate trunks of hemlock. Osceola. Aug.

Closely allied to *P. destructor*, but distinguished by its zonate pileus and short pores. It is also apparently thinner and more undulate than that species.

**Polyporus (Physisporus) lætificus, n. sp.**

Effused, thin, tender, not readily separable from the matrix, bright orange with a subtomtose yellowish margin; tubes short, often oblique minute, subrotund, the dissepiments thick, obtuse.

Decaying wood. South Ballston. Aug.

The fungus forms patches two or three inches long, following the inequalities of the surface. In the dried state the pores appear like little ruptured vesicles as in *P. vesiculosus*, B. & C. The species appears to approach *P. fulgens*, Rost., which has the margin white fibrillose and the pores acute.

**Polyporus (Physisporus) griseoalbus, n. sp.**

Effused, thin, tender, adnate, uneven, scarcely margined, indeterminate, grayish-white, with a thin pulverulent subiculum; pores very minute, subrotund, often oblique.

Soft decaying wood of deciduous trees. Osceola. July.

The pores are sometimes collected in little heaps or tubercles as in *P. molluscus* and *P. Vaillantii*. In the dried state they are slightly tinged with creamy yellow.

**Polyporus (Physisporus) fimbriatellus, n. sp.**

Widely effused, thin, tenacious, separable from the matrix, with a thin white fimbriate margin and a white subiculum, running into rhizomor-

phoid branching strings of mycelium or forming a somewhat reticulate fimbriate membrane ; pores minute, subrotund, equal, whitish inclining to cream color.

Under side of prostrate trunks of maple, forming extensive patches on the wood and bark. Osceola. Aug.

By its rhizomorphoid mycelium this species is related to *P. Vaillantii*, but the pores are smaller and not collected in heaps as in that species. By reason of its tenacious substance it is readily separable even from an irregular matrix.

### **Polyporus (Physisporus) ornatus, n. sp.**

Effused, 1 to 2 lines thick, somewhat tenacious, adnate or inseparable from the matrix, white, the surface slightly undulate or uneven, the margin definite, studded with drops of moisture when fresh, spotted with dot-like depressions when dry ; pores subrotund, minute, unequal, often oblique.

Decaying prostrate trunks of deciduous trees. Osceola. Aug.

This species is at once distinguished by its adnate subiculum and its peculiarly spotted margin. The spots are watery white in the fresh state and each one is covered by a drop of moisture. In the dried plant the place previously occupied by the drop of moisture becomes a small depression in the subiculum.

### **Polyporus (Physisporus) odoratus, n. sp.**

Effused, 2 to 3 lines thick, even, firm but brittle, moist, separable from the matrix, white, sometimes stained with reddish-yellow on the abrupt, rather thick, slightly fimbriate margin ; pores very minute, rather long, equal, entire, white, arising from a thin but distinct subiculum ; odor strong, disagreeable.

Under surface of decorticated prostrate trunks of spruce. Osceola. Aug.

It forms patches several inches broad and sometimes more than a foot long. It is distinguished from *P. vulgaris* by being separable from the matrix, moist, having longer pores and a strong odor. From the next following species it may be known by its smaller pores, more brittle texture and its different odor.

### **Polyporus (Physisporus) subacidus, n. sp.**

Effused, separable from the matrix, tenacious, flexible, uneven, determinate, the margin downy, narrow, pure white ; pores small, subrotund, 1 to 3 lines long, often oblique. whitish inclining to dingy-yellowish pale tan color or dull cream color, the dissepiments thin, more or less dentate ; odor strong, subacid.

Prostrate trunks and decaying wood of various trees, hemlock, spruce, birch, etc. Osceola. July.

This species is not rare, but it has probably been confused with its allies. It forms extensive patches, sometimes several feet in length. It adheres somewhat closely to the matrix, but its texture is so tough that it is generally easy to strip it from its supporting substance. It is apparently closely related to *P. medulla-parvis*, but the description of that



species gives the pores as medium size and entire, and makes no mention of any odor, in consequence of which we have thought our plant distinct. It is, however, extremely variable.

Var. *tenuis* is very thin, scarcely a line thick, with short pores and the surface nearly even. It occurs on the smooth decorticated trunks of hemlock.

Var. *tuberculosis* has the surface more or less roughened by unequal prominent tubercles, which are either scattered or clustered. They appear to be a monstrous development of the mycelium on the surface of the pores.

Var. *stalactiticus* incrusts mosses and therefore has the surface very uneven with numerous and unequal porous protuberances. It most often occurs on prostrate mossy trunks of birches.

Var. *vesiculosus* (*P. vesiculosus*, B. & C.) has shallow scattered pores as if formed from ruptured vesicles.

Specimens of this *Polyporus*, unless dried under pressure, shrink and roll up in unmanageable shapes. They often contain considerable moisture when collected, and if put in press in this condition they are liable to become brown or blackish in drying. Specimens collected in a dry time or in dry situations retain their characters best. The thinner forms, if partly dried before they are put in press, sometimes retain their color and characters well. When growing on bark the patches are sometimes interrupted and irregular, in which case the margin is broader than usual and well defined.

### ***Merulius (Resupinati) aurantiacus, n. sp.***

Effused, membranous, tender, very soft, separable from the matrix, pale orange color, the subiculum soft, silky-tomentose, whitish and pale orange; hymenium gyrose-plicate and dentate, becoming paler with age; spores broadly elliptical, .00025 in. long, .0002 broad.

Soft decayed wood of hemlock. Osceola. Aug.

The species is distinguished by its soft tomentose texture and its orange hues. It is closely related to *M. aureus* but is at once distinct by its orange, not golden, color. The subiculum is composed of a stratum of whitish filaments next the matrix and another of orange color next the hymenium. Hence the margin in young plants is generally whitish. In mature ones the whole becomes orange colored. Notwithstanding the tender substance the membrane is separable from the matrix and pieces three or four inches in extent are thus obtainable.

### ***Merulius fugax, Fr.***

Soft decayed wood of deciduous trees. Osceola. Aug.

This has the tender, soft and delicate texture of the preceding species, but it is at first of a pure white color. Soon the hymenium assumes a creamy or yellowish hue and the folds appear, but there is often a wide margin destitute of them. In drying, the folds mostly collapse and disappear and the hymenium often becomes tinged with incarnate or flesh color. The wood on which it usually grows is so much decayed that it easily crumbles to pieces. Nevertheless the plant is separable from its matrix.

The spores are oblong, .0003 in. long, .0001 broad.

**Geaster striatus, DC.**

Sandy soil. Karner. Sept.

When the external peridium first opens and expands the inner peridium appears to be globose and sessile, but as the plant matures and dries the inner peridium is seen to be narrowed below and raised on a short pedicel.

**Phyllosticta Labruscæ, Thum.**

Living leaves of grapevines, *Vitis Labrusca*. Highland Mills, Orange county. July.

This differs from *P. viticola* in its more numerous, larger and more prominent perithecia and in its larger spores.

**Phyllosticta Epigææ, n. sp.**

Spots large, irregular, brown or reddish-brown; perithecia minute .0045 to .0055 in. broad, covered by the epidermis, erumpent, epiphyllous, black; spores elliptical, colorless. .0003 in. long, .00016 broad.

Living leaves of trailing arbutus, *Epigæa repens*. Caroga. July.

**Phyllosticta lantanoidis, n. sp.**

Spots rather large, suborbicular, cinereous, sometimes with a brown margin; perithecia minute, .004 in. broad, slightly prominent, epiphyllous, black; spores elliptical, colorless, binucleate, .00025 to .0003 in. long, .00016 broad.

Living leaves of hobble bush, *Viburnum lantanoides*. Caroga. July.

This differs from *P. tineæ* Sacc. in the larger size and binucleate character of the spores.

**Phyllosticta Podophylli, Winter.**

Living leaves of mandrake, *Podophyllum peltatum*. Albany. June.

Externally this resembles *Ascospora Podophylli* Curt., but the spores are very different.

**Ascochyta Cassandræ, n. sp.**

Spots suborbicular or irregular, reddish-brown or grayish with a reddish-brown margin; perithecia epiphyllous, minute, erumpent, blackish; spores oblong-fusiform, acute at each end, uniseptate, colorless, .0004 to .00065 in. long, .00012 to .00016 broad.

Living leaves of leather-leaf, *Cassandra calyculata*. Adirondack mountains. June and July.

**Ascochyta colorata, n. sp.**

Plate 2, figs. 9 and 10.

Spots indefinite, often confluent, red with a brownish center, paler on the lower surface; perithecia minute, .004 to .005 in. broad, black; spores oblong, somewhat pointed at one or both ends, straight or curved, slightly constricted in the middle, obscurely uniseptate, colorless, .0007 to .001 in. long, .0003 to .00035 broad.

Living leaves of strawberry, *Fragaria Virginiana*. West Albany. Aug.

This differs from *A. Fragariæ* Sacc. in the color of the spots and in the size and character of the spores.

**Phoma Phytolaccae, B. & C.**

Dead stems of poke weed, *Phytolacca decandra*. Albany. June.

In our specimens the spores are a little longer than the dimensions given in the description of the species and the perithecia are sometimes slightly compressed or subhysteriiform.

**Phoma elevatum, n. sp.**

Perithecia numerous, small, rotund, oval or hysteriiform, sunk in the matrix but occupying small elevations or ridges, black; spores ovate or subelliptical, colorless, .0003 in. long, .00016 broad.

Decorticated wood of deciduous trees. Adirondack mountains. June.

The marked feature of the species and one suggestive of the name is the position of the perithecia. Each one occupies a minute ridge or pustular elevation of the wood.

**Phoma Pruni, n. sp.**

Perithecia small, slightly prominent, subconical, at first covered by the epidermis, then erumpent, black; spores oblong-elliptical or subfusiform, binucleate, hyaline, .00035 to .00045 in. long, .00012 to .00016 broad, supported on equally long or longer sporophores.

Dead branches of choke cherry, *Prunus Virginiana*. Karner. June.

**Phoma albifructum, n. sp.**

Perithecia numerous, large, .02 to .03 in. broad, conical or subhemispherical, sometimes irregular and two or three confluent, erumpent, black; spores oblong-fusiform, acute at each end, two to four-nucleate, colorless, .00065 to .00085 in. long, .0002 to .00025 broad, oozing out and forming a white globule.

Dead bark of maple, *Acer rubrum*. Karner. June.

The perithecia and spores are unusually large for a *Phoma* and would seem to justify Prof. Saccardo's proposed genus *Macrophoma*.

**Sphærospis ribicola, C. & E.**

Dead stems of *Ribes floridum*. Bethlehem, Albany county. May.

**Sphærospis alnicola, n. sp.**

Perithecia numerous, .0014 to .002 in. broad, prominent, hemispherical, erumpent, sometimes confluent, forming black patches, spores oblong, colored, .0006 to .00095 in. long, .00035 to .0004 broad.

Dead branches of alder. West Albany. Apr.

*S. Alni* C. & E. has smaller spores and inhabits living branches.

**Appendicularia, gen. nov.**

Plate 8, figs. 1-4.

Perithecium thin, delicate, rostrate, supported on a filamentous pedicel and accompanied by an appendage at its base. Entomophilous.

This genus has been formed to receive the single species here described. Its name is suggested by the appendicular organ at the base of the perithecium and supported with it by the common pedicel.

*Appendicularia entomophila*, n. sp.

Perithecia oval, brown, .0045 to .0055 in. long, .0035 to .004 broad, tapering abruptly above into a long, pale, somewhat pointed, straight or slightly curved rostrum .008 to .0095 in. long and about one-tenth as broad, supported below by a pale pedicel .012 to .013 in. long, about one-tenth as broad; pedicel two-septate, slightly thickened at the apex and bearing on one side, at the base of the perithecium, an oblong appendage about .0016 in. long; spores narrowly fusiform, pointed at each end, septate near the middle, colorless, .0012 to .0018 in. long, about one-tenth as broad, escaping at the apex of the rostrum.

On small flies, *Drosophila nigricornis*, Nyack, Rockland county. March. Rev. J. L. Zabriskie.

Specimens of this minute but interesting fungus, beautifully mounted on microscopic slides, were sent me by Mr. Zabriskie, who discovered them on small flies in his cellar in March last. He writes that they appeared during the first warm days of Spring, but disappeared upon the return of colder weather a few days later. The fungus grows upon almost any part of the body, the head, thorax, abdominal rings and occasionally on the costæ of the wings, but most frequently on the legs. Attached to one leg sent me are seven well-developed specimens of the fungus and one or two imperfect ones. The whole fungus is about one-fortieth of an inch long, or less than one-third of a line. It would not, therefore, be readily seen by the untrained naked eye of an observer. The perithecium, which is of a beautiful amber-brown color in the mounted specimens, appears like an enlargement of the central part of the fungus, its long rostrum or beak extending above it nearly as far as its pedicel does below it. The pedicel has one septum a little below the perithecium and another a little below the middle. At the apex it is slightly thickened, which gives it a somewhat clavate shape, and this enlargement is obscurely marked by short transverse and longitudinal septa or wrinkles. On one side, at the base of the perithecium is the singular erect appendage, the office of which is involved in obscurity. It is even and glabrous on the side next the perithecium, but elsewhere it is roughened by short ascending projections or serrations.

The affinities of the fungus are not clear. The non-ascigerous perithecium, the long, slender rostrum and the free spores oozing out at its apex indicate a relationship to species of *Sphæronema* (a genus of imperfect fungi), but the delicate texture and filamentous pedicel are very unlike any thing in that genus. Possibly its true relationship may be with the *Saprolegniæ*, but for our present purpose it is placed with the imperfect fungi.

*Sphærographium hystricinum*, Sacc.

Plate 3, figs. 5-7.

Dead stems of *Viburnum nudum*. Caroga. July.

This is *Sphæronema hystricinum*, Ellis, and is possibly a condition of some species of *Cenangium*.

*Sphærographium lantanoidis*, n. sp.

Perithecia minute, terete or subconical, truncate at the apex, black; spores subfiliform, curved or flexuous, slightly narrowed toward each



end, colorless, sometimes multinucleate, .0016 to .0025 in. long, oozing out and forming a whitish globule

Dead stems of *Viburnum lantanoides*. Adirondack mountains. June.

**Gelatinosporium fulvum, n. sp.**

Perithecia cæspitose, crowded, erumpent, externally pulverulent, pale-tawny, opening at the apex when moist and revealing the white spore-mass within; spores elongated, curved, gradually tapering toward each end, colorless, .003 in. long.

Dead branches of birch, *Betula lutea*. Caroga. July.

This is the third species of this genus that has its habitat on birch.

**Coniothyrium valsoideum, n. sp.**

Perithecia cæspitose, crowded, erumpent, surrounded by the laciniae of the ruptured epidermis, subglobose or angular from mutual pressure, black; spores numerous, subglobose or ovate, colored, .0002 to .00025 in. long, nearly as broad.

Dead branches of alder. West Albany. Apr.

**Septoria Ribis, Desm.**

Living leaves of fetid currant, *Ribes prostratum*. Adirondack mountains. June.

**Septoria alnicola, Cke.**

Living leaves of alder, *Alnus incana*. Caroga. July.

**Septoria Lysimachiae, West.**

Living leaves of *Lysimachia ciliata*. Osceola. Aug.

**Septoria Dalibardæ, n. sp.**

Spots small, whitish or cinereous, with a reddish-brown margin, perithecia minute, epiphyllous, few, black; spores filiform, nearly straight, .0015 to .002 in. long.

Living leaves of *Dalibarda repens*. Caroga. July.

This species closely resembles *S. Waldsteiniae*, but the spores are much longer than in that species.

**Septoria Dentariæ, n. sp.**

Spots large, suborbicular, indefinite, greenish, perithecia minute, numerous, slightly prominent, epiphyllous, black; spores filiform, nearly straight, .0008 to .0012 in. long, oozing out in yellowish or amber-colored tendrils or masses.

Living or languishing leaves of pepper-root, *Dentaria diphylla*. Adirondack mountains. June.

**Septoria punicea, n. sp.**

Spots two to four lines broad, indefinite, blackish-brown above, brown or reddish-brown below, perithecia hypophyllous; spores very long, flexuous, filiform, white in the mass, .004 to .0045 in. long.

Living leaves of *Aster puniceus*. Caroga. July.

The species is well marked by its very long and very white spores.

**Septoria Trillii, Pk.**

Living leaves of *Trillium erectum*. Adirondack mountains. June.

**Septoria fumosa, n. sp.**

Spots angular or irregular, often confluent, smoky-brown or grayish-brown with a darker margin; perithecia epiphyllous, .0025 to .003 in. broad, black; spores filiform; .0012 to .002 in. long.

Living or languishing leaves of *Solidago Canadensis*. Albany. June. The spores are shorter than those of *S. Virgaureæ*.

**Septoria Diervillæ, n. sp.**

Spots suborbicular, whitish or cinereous, with a broad indefinite brown or purplish-brown margin; perithecia epiphyllous, minute, black; spores filiform, curved or flexuous, very slender, .001 to .0016 in. long. Living or languishing leaves of *Diervilla trifida*. Adirondack mountains. June.

The spots, which are at first brown or purplish-brown, at length become paler and arid in the center, and on this central part the perithecia appear.

**Rhabdospora subgrisea, n. sp.**

Perithecia numerous, punctiform, depressed, black, covered by the epidermis, generally forming long, indefinite, grayish-brown spots; spores filiform, straight or curved, .0012 to .0025 in. long.

Dead stems and galls of various species of *Solidago*. Albany. *G. W. Clinton*. West Albany. Apr. and May.

**Diplodia pinea, Kx.**

Dead bark of pine, *Pinus Strobus*. West Albany. May.

In our specimens the spores are .0008 to .0014 in. long and .0005 to .0007 broad, which is somewhat less than the dimensions given in the description. Our plant is, therefore, distinguished as variety *corticola*.

**Staganospora Smilacis, Sacc.**

Living leaves of *Smilax herbacea*. Albany. *G. W. Clinton*. West Albany. May.

The spots closely resemble those of *Sphæropsis smilacina*, Pk., *Phoma smilacina*, Sacc., which may be an immature or imperfectly developed form of the same species. It is *Ascochyta Smilacis*, E. & M.

**Glæosporium Ribis, Cast.**

Living or languishing leaves of fetid currant, *Ribes prostratum*. Adirondack mountains. June.

In our specimens the spores are a little longer than in our European specimens and longer than the dimensions given in some of the descriptions, but I see no other difference.

**Glæosporium Salicis, West.**

Languishing leaves of *Salix longifolia*. North Greenbush. Sept.

Our specimens have the spores either simple or two or three-nucleate.

and generally a little thicker toward one end. In size they are .0006 to .0009 in. long, .0003 to .0004 broad. Fuckel considers the species as the stylosporous condition of *Trochila Salicis*, Tul. It is very unlike *Glæosporium salicinum*, Pk., which is rather a Septoglæum, though the septa are obscure.

### **Marsonia Quercus, n. sp.**

Spots angular or suborbicular, whitish or reddish-gray, definite, nucleus hypophyllous; spores oblong or subcylindrical, straight or curved, slightly constricted in the middle, obscurely uniseptate, colorless, .0005 to .0006 in. long, .0001 to .00016 broad, oozing out and forming a reddish or reddish-amber colored tendril or mass.

Living leaves of *Quercus ilicifolia*. Karner. Aug.

### **Pestalozzia monochætoidea, S. & E.**

Dead stems of nine-bark, *Spiræa opulifolia*. West Albany. Apr.

### **Ramularia Diervillæ, n. sp.**

Plate 1, figs. 16-18.

Spots suborbicular, whitish or cinereous with a dark-brown margin, definite; flocci amphigenous, minute, tufted; spores cylindrical, colorless, .0005 to .001 in. long, .00008 to .00016 broad.

Living leaves of *Diervilla trifida* Adirondack mountains. June.

### **Ramularia multiplex, n. sp.**

Spots large, sometimes occupying the whole leaf, red or greenish-yellow, becoming brown when old, the lower surface, and sometimes both surfaces, frosted by the fungus; flocci and spores whitish or subcinereous, the latter very variable, subglobose elliptical, oblong or cylindrical, .00016 to .002 in. long, .00016 to .0002 broad, sometimes catenulate.

Living leaves of cranberry, *Vaccinium Oxycoccus*. Caroga. July.

### **Ramularia Prini, n. sp.**

Plate 1, figs. 19-21.

Spots small, suborbicular, cinereous or whitish, with a brown margin, definite; spores hypophyllous, oblong or subfusiform, colorless, .0005 to .0009 in. long, .00016 to .0002 broad.

Living leaves of *Ilex verticillata*. Caroga. July.

The spores are tufted, but so minute that they are scarcely visible to the naked eye. This and the two preceding species are referred to the genus *Ramularia* with some hesitation. The hyphæ are minute and obscure, and I have seen no septate spores, but in other respects they appear to belong here. The next species, which rarely has uniseptate spores, forms a connecting link between these and the succeeding one.

### **Ramularia Oxalidis, Farl.**

Plate 1, figs. 13-15.

Living leaves of wood sorrel, *Oxalis acetosella*. Adirondack mountains. June.

**Cylindrosporium veratrinum, S. & W.**

Plate 1, figs. 10-12.

Living leaves of Indian poke, *Veratrum viride*. Adirondack mountains. June.

This fungus appears to me to be ambiguous, between the genera *Cylindrosporium* and *Ramularia*. Distinct, though short hyphæ are present; and the spores are very long and clearly septate, in violation of the generic character of *Cylindrosporium*. The fungus is sometimes either associated with or followed by oblong black spots or patches, which are sometimes confluent, and which bear minute black perithecia containing oblong or cylindrical spore-like bodies about .0002 in. long.

**Ovularia moniloides, E. & M.**

Plate 2, figs. 1-4.

Living leaves and dead branches and aments of sweet gale, *Myrica Gale*. Adirondack mountains. June.

A very variable species. Sometimes the spots are few and scattered, again they are numerous, small or large, and often confluent, occupying nearly the whole leaf. Sometimes the fungus extends to the branches, both dead and living, which it surrounds with its white flocculent patches.

**Peronospora Arthuri, Farl.**

Living leaves of evening primrose, *Oenothera biennis*. Albany. June.

**Peronospora Halstedii, Farl.**

Living leaves of *Ambrosia trifida*. North Greenbush. Sept.

This often grows upon the spots occupied by *Protomyces polysporus*.

**Peronospora Potentillæ, De By.**

Living leaves of purple avens, *Geum rivale*. Adirondack mountains. June.

**Entyloma Saniculæ, n. sp.**

Plate 1, figs. 7-9.

Spots numerous, small, close or subconfluent, orbicular or subangular, varying in color from whitish or greenish to brown or reddish-brown; conidia amphigenous, filiform or linear, straight or curved, colorless, .0012 to .0024 in. long, .00008 to .0001 broad. Sometimes plurinucleate; spores subglobose, .00055 to .00065 in. broad.

Living leaves of sanicle, *Sanicula Marilandica*. North Greenbush. May.

The very long slender conidia are a distinguishing feature in this species.

**Cercospora Violæ, Sacc.**

Living leaves of violets, *Viola blanda*. Osceola. Aug.

In our specimens the spores are shorter than the dimensions given for the type, from which it is probable that they are a variety. They are .003 to .004 in. long, but pluriseptate as in the typical specimens.

**Cercospora Cephalanthi, E. & K.**

Living leaves of *Cephalanthus occidentalis*. Karner. Aug.



**Cercospora Comari, n. sp.**

Plate 1, figs. 1-3.

Spots irregular, indefinite, sometimes confluent, reddish-brown; flocci minutely tufted, amphigenous, slender, flexuous, colored, .005 to .0065 in. long, .0002 broad; spores clavate, obscurely two to three septate, slightly colored, .002 to .003 in. long, .0003 broad in the widest part.

Living leaves of *Potentilla palustris* (Comarum palustre). Karner. July.

**Cercospora Majanthemi, Fekl.**

Living leaves of two-leaved Solomon's Seal, *Majanthemum bifolium*. Caroga. July.

Our specimens vary a little from the description of the species to which we have referred them, but they are probably only an American variety of the species. The spots are margined with red or brownish-red and the spores are nucleate, but I have not seen them septate. They appear to rise from a minute reddish or pink-colored tubercle.

**Hadrotrichum lineare, n. sp.**

Plate 1, figs. 4-6.

Flocci amphigenous, densely cæspitose, subflexuous, black, forming oblong or linear black sori; spores terminal, ovate, oblong-ovate or oblong-pyriform, colored, .00065 to .0011 in. long, .00045 to .00055 broad, sometimes becoming constricted in the middle.

Living and dead leaves of *Calamagrostis Canadensis*. Adirondack mountains. June.

I have referred this fungus provisionally to the genus *Hadrotrichum*, although it does not rigidly agree with the description of that genus, in which the flocci are characterized as short. In our plant they are .002 to .003 in. long. By their tufted mode of growth they appear to deviate from the allied genus *Monotospora*. The spores, so far as observed, do not become definitely uniseptate, though in a few instances the endochrome seemed to be divided and the spores constricted in the middle as if about to multiply by division. They are colored, but are slightly paler than the flocci. These form definite linear or oblong sori or patches which are often parallel and sometimes repeatedly interrupted and look like a series of dots. At first sight they might be mistaken for some species of *Puccinia*.

**Cenangium balsameum, n. sp.**

Receptacle single or cæspitose, sessile, erumpent, externally black or blackish, greenish-yellow within, disk plane or convex, blackish bay-red or greenish-yellow when moist, black and somewhat uneven when dry; asci clavate, .004 to .0055 in. long, .0005 to .0006 broad; spores oblong or subfusiform, sometimes slightly curved, simple, greenish-yellow, .0008 to .0012 in. long, about .0003 broad.

Dead branches of balsam, *Abies balsamea*. Caroga. July.

This has probably been confused with *C. ferruginosum*, which it somewhat resembles, but the spores are much larger than the dimensions ascribed to the pores of that species, and larger than the spores in the specimens of that species in *Mycotheca Universalis*.

**Sphærotheca pannosa, Lev.**

Living leaves of wild rose, *Rosa parviflora* Ehrh. West Albany. Aug.

**Microsphæria Nemopanthis, n. sp.**

Mycelium arachnoid, thin, amphigenous; appendages few, five to twelve, equal to or a little longer than the diameter of the perithecia, terminally four or five times dichotomous, colored, sometimes forked near the base, the ultimate ramuli recurved; asci about four; spores six to eight.

Living leaves of *Nemopanthes Canadensis*. Karner. Sept.

The species is apparently allied to *M. Berberidis*, from which it is separated because of its fewer asci and colored appendages.

**Capnodium Citri, B. & D.**

On oranges, Albany. Not ascigerous. Introduced with the fruit which it inhabits.

**Asterina nuda, n. sp.**

Plate 2, figs. 11-15.

Perithecia numerous, closely gregarious or crowded, superficial and naked or with a few short obscure radiating filaments at the base, globose or subdepressed, .003 to .004 in. broad, black; asci oblong or subcylindrical, .0016 in. long, .0005 broad; spores crowded or biseriate, oblong, uniseptate, colorless, .0004 to .0005 in. long, .0002 to .00025 broad.

Dead leaves of balsam fir, *Abies balsamea*. Adirondack mountains. June.

Externally this species resembles *Sacidium Pini*, but its fruit is very different. The perithecia are generally arranged in three linear patches, one along the middle of the upper surface of the leaf and two on the lower surface, one on each side of the midvein. They are less numerous on the upper surface than on the lower, and are sometimes entirely absent there. The radiating mycelioid filaments are not always present, and but for the superficial perithecia the species might easily be referred to the genus *Sphærella*. The bilocular colorless spores indicate the section *Asterella*.

**Valsa pauperata, C. & F.**

Dead bark of maple, *Acer rubrum*. Karner. June.

In our specimens it is not uncommon to find a half dozen perithecia in one pustule, although in the typical form there are but two or three. A whitish or pale-grayish pulverulent disk often exists, which is at length obliterated by the black ostiola. The spores are .00064 to .0008 in. long, .0002 to .00025 broad, which is somewhat larger than the dimensions given in the description of *V. pauperata*, nevertheless we think our specimens are only a form or perhaps a variety of that species. The pustules are often arranged in long flexuous lines as in the type.

**Valsa cornina, n. sp.**

Pustules small, scattered, at first covered by the epidermis, which is at length longitudinally ruptured; perithecia two to five in a pustule,

nestling in the inner bark, black, the ostiola scarcely exerted ; asci clavate, blunt, .002 to .0024 in. long ; spores collected in the upper part of the ascus, allantoid, .0006 to .0007 in. long, .00016 broad.

Dead branches of *Cornus paniculata*. Albany. Apr.

I have distinguished this species from others growing on *Cornus*, because of its different habit and larger spores.

### ***Valsa Friesii*, Fekl.**

Dead bark of *Abies balsamea*. Adirondack mountains. June.

### ***Valsa opulifoliæ*, n. sp.**

Pustules subconical or subhemispherical, erumpent ; perithecia five to twenty in a pustule, nestling in the inner bark, crowded, often angular from mutual pressure, ostiola crowded, black, obliterating the grayish disk ; asci subclavate, the sporiferous part .0012 to .0016 in. long, .00025 to .0003 broad ; spores allantoid, crowded above, uniseriate below, .0004 to .0005 in. long, .00008 to .0001 broad.

Dead branches of *Spiræa opulifolia*. West Albany. Apr.

The species is apparently related to *V. pustulata* Aw., but the crowded ostiola are central on the disk. When the epidermis is torn away the pustules appear much like those of *V. colliculus* Wormsk.

### ***Valsa leucostomoides*, n. sp.**

Pustules numerous, minute, covered by the epidermis which is pierced by the orbicular white or grayish disk ; perithecia two to six or more in a pustule, the ostiola punctiform, black, dotting the disk ; asci clavate or subfusiform, .0016 to .002 in. long, .00035 to .0004 broad ; spores crowded, allantoid, colorless, .0005 to .00065 in. long, .00016 to .0002 broad.

Dead branches of sugar maple, *Acer saccharinum*. Helderberg mountains. May.

The very small size of the pustules and the minute white pulverulent disk give to this species an external appearance resembling that of *V. leucostoma* Fr., but there is no circumscribing black line and the species is apparently quite distinct and easily known by this character.

### ***Diatrypella Frostii*, Pk.**

Dead stems of wild hazel-nut, *Corylus Americana*. West Albany Nov.

### ***Diaporthe Wibbei*, Nts.**

Dead branches of sweet gale, *Myrica Gale*. Adirondack mountains. June.

The species is placed in the section *Tetrastaga*, but in our specimens there is no circumscribing black line. The spores are a little broader than the dimensions given in the description, being .0002 to .00025 in broad, and they sometimes terminate in a slight bristle-like point. In other respects the specimens agree well with the specific characters.

**Diaporthe cylindrospora, n. sp.**

Pustules valsooid, somewhat prominent, erumpent, scattered; perithecia numerous, fifteen to thirty or more, crowded, covered by the thin blackened surface of the inner bark, the ostiola rather long, crowded, exserted, about equalling the surrounding elevated epidermis, black; asci narrow, subfusiform, .0018 to .0022 in. long, .00025 to .0003 broad; pores subcylindrical, crowded or biseriate, quadrinucleate, colorless, .0005 to .00065 in. long, .00012 to .00016 broad.

Dead branches of wild bird cherry, *Prunus Pennsylvanica*. Adirondack mountains. June.

I have not been able to detect any distinctly septate spores, yet in every other respect this fungus evidently belongs to this genus, and I have thought best to refer it here for the present.

**Didymosphæria Typhæ, n. sp.**

Perithecia minute, punctiform, subglobose, covered by the epidermis, which is pierced by the scarcely papillate ostium; asci cylindrical, .0025 to .0035 in. long, .0003 to .0004 broad; spores oblong or elliptical, uniseriate, uniseptate, not at all or but slightly constricted at the septum, colored, .0004 to .0006 in. long, .0002 to .00025 broad; paraphyses filiform.

Base of dead leaves of *Typha latifolia*. Guilderland, Albany county. May.

**Sphærella conigena, n. sp.**

Perithecia small, scattered or gregarious, slightly prominent, erumpent, black; asci subcylindrical, .0025 to .0035 in. long, about .0005 broad; spores crowded, oblong-clavate, constricted at the septum, .0004 to .0005 in. long, .00016 to .0002 broad, the cells unequal, the lower one tapering downward, narrower than the subglobose or elliptical upper one.

Fallen cones of hemlock, *Abies Canadensis*. Helderberg mountains. May.

It differs from *S. Pinsapo* in its longer asci, and longer and differently shaped spores, as well as in its habitat. A similar, if not the same, species occurs on cones of *Thuja occidentalis* in the same locality, but owing to the immaturity of the fruit it is still in doubt.

**Venturia Cassandra, n. sp.**

Plate 8, figs. 11-14.

Spots reddish-brown or brownish, sometimes with a grayish center; perithecia on one or both surfaces, minute, .0028 to .0032 in. broad, black, with a few short, straight, diverging black setæ above, .0012 to .0016 in. long; asci oblong, gradually and slightly narrowed above, .0016 to .0018 in. long, .0003 to .0004 broad; spores biseriate, oblong, quadrinucleate, .0005 in. long, .0002 broad.

Living leaves of *Cassandra calyculata*. Caroga. July.

The perithecia sometimes occur on the upper surface of the leaf, but oftener on the lower. They are so small that they are scarcely visible to the naked eye. Sometimes they emerge from beneath the scales of the leaf, and then they appear erumpent, although in reality they are superficial.



**Leptosphæria Corallorhizæ, n. sp.**

Plate 2, figs. 20-23.

Perithecia numerous, minute, .004 to .005 in. broad, erumpent, black, with a minute ostiolum; asci cylindrical, sessile, .002 to .003 in. long, .0003 to .00035 broad; spores crowded or biseriata, subfusiform, triseptate, slightly constricted at the middle septum, yellowish-brown, .0008 to .001 in. long, .00016 to .0002 broad.

Dead stems of *Corallorhiza multiflora*. Caroga. July.

**Leptosphæria eutypoides, n. sp.**

Perithecia numerous, closely gregarious, .01 to .011 in. broad, hemispherical or depressed, at first covered by the epidermis, then naked, black, ostiola papilliform; asci clavate or subcylindrical, .004 to .0045 in. long, .0005 to .00065 broad; spores ovate or oblong, straight or slightly curved, triseptate, usually constricted at the septa, yellowish-brown, .0008 to .0009 in. long, .0003 to .0004 broad, paraphyses filiform.

Dead stems of large herbs, as *Chenopodium album*. Albany. May.

The matrix becomes blackened, which, with the nearly uniform distribution of the numerous perithecia, is suggestive of the appearance of some species of *Eutypa*.

**Leptosphæria lycopodiicola, n. sp.**

Plate 2, figs. 16-19.

Perithecia small, .005 to .006 in. broad, sphaeroid or elliptical, erumpent, black; asci subcylindrical, nearly sessile, .0025 to .003 in. long, .0003 to .0004 broad; spores oblong or subfusiform, slightly colored, three to five-septate, .0008 to .001 in. long, .00016 to .0002 broad.

Dead peduncles of *Lycopodium clavatum*. Adirondack mountains. June.

The perithecia are associated with a minutely tufted, blackish Cladoporium. Some of them are laterally compressed. The covering epidermis generally ruptures longitudinally. The spores are much more narrow in this than in *L. Crepini* and *L. Marcyensis*, both of which inhabit species of *Lycopodium*.

**Metasphæria Myricæ, n. sp.**

Plate 2, figs. 24-27.

Perithecia numerous, broadly conical, .016 to .021 in. broad, covered by the thin closely-adhering epidermis, black, white within, ostiola pertuse; asci clavate, obtuse, .004 to .005 in. long, .0006 to .0008 broad; spores crowded or biseriata, oblong or subfusiform, straight or slightly curved, at first uniseptate, quadrinucleate, strongly constricted at the middle septum, finally triseptate, colorless, .0012 to .0016 in. long, .0004 to .0005 broad; the paraphyses numerous, conglutinate.

Dead branches of *Myrica Gale* lying partly in water. Caroga. July.

The epidermis is so closely adherent that the perithecia appear as if superficial or merely innate at the base. The nuclei of the spores are large. Spores with three septa are rare, but this may be due to the immature condition of the specimens.

**Sphærulina sambucina, n. sp.**

Perithecia minute, numerous, closely gregarious, unequal and irregular, orbicular, oblong or even flexuous, covered by the epidermis, erumpent, opening by a pore or a narrow chink, black, asci clavate or subcylindrical, .093 to .005 in. long, about .0005 broad, aparaphysate; spores crowded or biseriate, oblong-clavate, constricted at the middle septum, five to seven-septate, colorless, .0009 to .0012 in. long, .0003 to .00035 broad, the lower half more narrow than the upper.

Dead branches of elder, *Sambucus Canadensis*. West Albany. May.

This is apparently related to *S. intermixta*, and, like that species, it is remarkable for its anomalous and irregular perithecia, but it is distinguished from it by its longer asci and longer spores, strongly constricted in the middle, and with more numerous septa.

**Cryptospora Caryæ, n. sp.**

Plate 2, figs. 28-31.

Pustules scattered, covered by the epidermis, erumpent, circumscribed by a black line or at length covered by a black crust beneath the epidermis, perithecia four to twelve in a pustule, globose or angulated by mutual pressure; ostiolar crowded, rather prominent, subglobose, even, black; asci subclavate, .004 to .005 in. long, .0005 to .0006 broad, spores crowded or biseriate, subcylindrical, slightly narrowed toward one or both ends, granular within, at length spuriously three to five-septate by the division of the endochrome, colorless, .0016 to .0024 in. long, .00025 to .00032 broad.

Dead branches of hickory, *Carya alba*. Knowersville. May.

The epidermis is loosened over the pustules and is generally ruptured in longitudinal chinks. When it is removed the blackened pustules are conspicuous. The spores are sometimes constricted in the middle.

**Mazzantia sepium, Sacc. & Penz.**

Dead stems of *Calystegia Sepium*. North Greenbush. May.

The spores in our specimens are a little larger than in the typical form and trinucleate.

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D.

**REMARKS AND OBSERVATIONS.****CAULOPHYLLUM THALICTROIDES, L.**

A form occurs on the Helderberg mountains which bears two panicles, or clusters of flowers. One is much smaller than the other, and is usually about three flowered.

**VIOLA CUCULLATA, Ait.**

The variety with peduncles, much longer than the petioles (var. *longipes*), is common in wet places in the Adirondack region. It blossoms there about the middle of June.

HYPERICUM ELLIPTICUM, *Hook.*

A small form with stems eight to twelve inches high, and leaves erect and appressed, was found in wet places by the roadside in Caroga. This position of the leaves gives a peculiar aspect to the plants.

RHUS TYPHINA, *L.*

The form with laciniate leaves has been found near Nyack, Rockland county, by *Rev. J. L. Zabriskie*.

ROSA SETIGERA, *Mx.*

Low ground near West Albany. Introduced from the West.

RUBUS HISPIDUS, *L.*

Common in Caroga and not infrequent with five-foliate leaves on the young stems.

FEDIA RADIATA, *Mx.*

Wynantskill, Rensselaer county. *H. C. Gordinier*. This is a form with smooth fruit.

ARALIA NUDICAULIS, *L.*

A form with no leaf but with the scape bearing four to six umbels at the apex and a branch near or below the middle. This branch is terminated by a single umbel, and probably represents the usual leaf.

ARALIA HISPIDA, *Mx.*

This sometimes grows with great vigor in the Adirondack region. A specimen was found in Caroga, more than three feet high and bearing upwards of forty umbels, the large central and terminal one being two and a half inches in diameter.

CUPHEA VISCOSISSIMA, *Jacq.*

This plant appears to be gradually extending its range northward in the Hudson river valley. It has occurred in the vicinity of Pine Plains and at Salt Point, Dutchess county, and the past season it was detected near Catskill by Judge *Clinton*. On the authority of Drs. Stevenson and Knieskern it was reported in the State Flora as an inhabitant of the "northern part of the State," but I suspect this is a mistake.

TUSSILAGO FARFARA, *L.*

Abundant on clay banks about Albany and Troy. In rare instances the leaves appear while the plant is yet in flower. The rays assume a reddish hue with age and the scapes become elongated.

HIERACIUM AURANTIACUM, *L.*

This plant has become well established in many parts of the State and is still spreading. The past season it was observed in Fulton county, where it had evidently escaped from a flower garden to the roadside.

VACCINIUM PENNSYLVANICUM, *Lam. var. NIGRUM.*

Caroga, where it was growing sparingly with the ordinary form of the species.

CASTILLEJA COCCINEA, *Spreng.*

The usual habitat, ascribed to this species in the manuals, is wet meadows and sandy low grounds. In Springwater, Livingston county,

and in Canadice, Ontario county, it was found by Mr. *D. Byron Waite* growing on the "tops and sides of bare dry and sterile hills, and where low shrubs and moss abound."

*HYDRANGEA ARBORESCENS, L.*

Wellsburg, Chemung county. *E. A. Burt.*

*POTAMOGETON ROBBINSII, Oakes.*

Hudson river near Rhinebeck. *H. Andrews.* The plants were sterile as usual.

*HABENARIA ROTUNDIFOLIA, Rich.*

Turin, Lewis county. July. *R. B. Hough.* This is the second locality in the State for this rare plant. Mr. Hough informs me that it is difficult to obtain perfect specimens of this plant, most of the flowers being injured, apparently by some insect.

*TRILLIUM GRANDIFLORUM, Salish. v. VARIEGATUM.*

This interesting variety or form has the leaves petiolate and the petals variegated with green, which is usually in the form of a broad longitudinal stripe through the middle. It was discovered in dense woods near Jamesville, Onondaga county, by members of the Syracuse Botanical Club, and specimens were contributed to the Herbarium by Mrs. *L. L. Goodrich* and Mrs. *S. M. Rust.* It has also been found on Goat Island by Hon. *G. W. Clinton.* In the Jamesville locality it was associated with *Trillium erectum* and typical *T. grandiflorum.* In one specimen communicated by Mrs. Goodrich the petioles originate near the ground, the stem being very short. They are about three and a half inches long and the peduncle is five inches long. In other specimens these parts are less elongated and the form appears to be merged into the type. The specimens indicate a coincidence between the petioles, peduncles and green color of the petals. Generally the longer petioles are accompanied by longer peduncles and broader green stripes on the petals. This coincidence between form and color is remarkable.

*JUNCUS TRIFIDUS, L.*

Sam's Point, Shawangunk mountains. Prof. *N. L. Britton.* Probably this is the most southern station for this *Juncus* in our State. It occurs at Lake Mohunk and also on the high summits of the Adirondack mountains.

*SCIRPUS POLYPHYLLUS, Vahl.*

Catskill. *G. W. Clinton.* A rare species in our State.

*SCIRPUS SYLVATICUS, L.*

Wet places about half a mile south-east of Loudonville.

*GLYCERIA FLUITANS, L.*

Caroga lake. The form with long flat linear floating leaves, suggestive of the specific name, is not rare in the lakes of the Adirondack region, but it is not always fertile.

*AIRA CÆSPITOSA, L.*

Wet ground. Caroga. It was growing in company with *A. flexuosa* which usually inhabits dry, rocky, sterile hills.



MILLIUM EFFUSUM, *L.*

A tall glaucous-leaved form, is plentiful in woods in the Boreas river valley in Minerva, Essex county.

PELLÆA GRACILIS, *Hook.*

About the entrance of a limestone cavern, Minerva. The presence of limestone appears to be a necessity to this rare little fern. Although there are many localities in the Adirondack region which seem favorable to its growth, I have never observed it there except in the immediate vicinity of limestone, and as this is in limited quantity and scattered stations, this fern occupies there very isolated and limited localities. In the station mentioned it was in company with *Aspidium aculeatum* Sw. v. *Braunii*.

WOODWARDIA VIRGINICA, *Sm.*

Abundant in a marsh near Karner.

AGARICUS STIPITARIUS, *Fr.* v. SETIPES.

Stem elongated, straight, very slender, three to four inches long, scarcely as thick as a knitting needle. Caroga. July. Specimens of this species revive on the application of moisture, thus indicating a close relationship to species of *Marasmius*.

AGARICUS CLAVICULARIS, *Fr.*

This species is quite variable with us. Three or four forms or varieties were found growing under balsam trees in one locality in Caroga. Var. *albus* is wholly white. Var. *cinereus* has the pileus and stem pale cinereous; this is the most common. Var. *filipes* has the pileus small, two or three lines broad, and the stem very slender or filiform. When moist the stem is viscid, and in taking it from its place of growth the fingers are liable to slip from their grasp before the plant yields from its attachment to the ground, but when dry it is taken without difficulty. The pileus is not viscid, and by this character the species may be distinguished from *A. vulgaris*.

AGARICUS LEAIANUS, *Berk.*

This beautiful Agaric is common in the woods of all our hilly or mountainous districts, growing most frequently on dead trunks of beech, but often on those of other deciduous trees. In a single instance it was found growing on decaying wood of hemlock.

## AGARICUS FIBULA v. CONICUS.

This singular variety has the pileus conical, not umbilicate, sometimes papillate. Mossy prostrate trunks in woods. Caroga. July.

AGARICUS ATROCÆRULEUS, *Fr.*

I have not yet found the plant with blue colors. It is brownish with us and villose with grayish densely tufted hairs, sometimes inclining to a cervine hue. On poplars. Karner. Sept.

AGARICUS RHODOPOLIUS, *Fr.* v. UMBILICATUS.

Pileus convex, umbilicate, 1 to 2 inches broad; lamellæ subdecurrent; stem elongated, slender, containing a small cavity. Karner. Sept. A slender variety growing with the ordinary form, but appearing quite unlike it.

TROGIA CRISPA, *Fr.* v. VARIEGATA.

Pileus and lamellæ variegated with bluish or greenish-blue stains. Sandlake. Sept.

BOLETUS VISCOSUS, *Frost.*

This name is antedated by *B. viscosus* Ventur., and if the Frostian species is a good one, it will be necessary to give it another name. It cannot be called *B. Frostii*, as there is already a species bearing that designation. Mr. Frost's plant is manifestly very near *B. granulatus* and may possibly be a variety of that species, although the two, as they occur with us, are readily distinguishable. They appear to have been united by European mycologists. The distinguishing characters are found in the color, glutinosity, glandular dots or sugary granules of the tubes and stem and in the comparative length of the stem. In Frost's plant the pileus is at first dark-chestnut color and covered with a thick tough gluten, appearing, as the author remarks, as if it "was enveloped in slime," but it becomes yellowish, tawny-yellow or reddish-yellow and less glutinous with age. The glandular dots are usually entirely absent from the mouths of the tubes and from the stem, but when present they are very minute and inconspicuous and occur chiefly at the top of the stem. This is very short, varying from one-half to one inch in length, so that "the pileus seems to rest upon the ground." In *B. granulatus*, the young pileus is much paler, though variable in color, and is less glutinous. It does not become conspicuously paler with age and the glandular dots or granulations, which suggest the name of the species, are readily seen on the tube mouths and stem. They usually dot the stem from top to base, though sometimes they are more conspicuous on the upper part. The stem is generally one to two inches long. This plant appears from midsummer to the end of the season, but I have only seen Frost's plant in late autumn. It is quite possible that the two plants run together, but from the character of the differences noted it seems to me to be best at present to keep them distinct, and for convenience of reference I would designate the Frostian species as *Boletus brevipes*, in allusion to its short stem. It grows in sandy soil under pine trees. Karner. Oct.

BOLETUS SCABER, *Fr.* v. NIVEUS.

Swamps. Karner. Oct. This is a beautiful variety, easily recognized by the white color of the pileus. This, however, becomes tinged with livid-blue or greenish-blue when old.

BOLETUS GRACILIS, *Pk.* v. LÆVIPES.

Stem destitute of reticulations. Otherwise like the typical form of the species. South Ballston. Sept.

POLYPORUS SULPHUREUS, *Fr.*

The young growing plant sometimes exudes a pale-yellow or sulphur-colored juice when cut or broken.

POLYPORUS VOLVATUS, *Pk.*

This is occasionally found on balsam trunks, *Abies balsamea*. Adirondack mountains. June.

POLYPORUS CONGLOMERATUS, *Pk.*

Prostrate trunks of beech. Osceola. Aug.

LYCOPERDON GIGANTEUM, *Batsch.*

A specimen of the obconic form mentioned by Fries was found near Coeymans, Albany county, by Mr. *John D. Parsons.*

MORTHIERA MESPILI, *Fckl.*

Living leaves of *Amelanchier Canadensis.* Caroga. July.

PUCCINIA CALTHÆ, *Lk.*

This species, which is rare in our State, was found in a wooded swamp in Caroga. July.

UROCYSTIS POMPHOLYGODES, *Schl.*

On *Thalictrum anemonoides.* Albany. *G. W. Clinton.*

CYSTOPUS CUBICUS, *De By.*

Radical leaves of *Senecio aureus.* Adirondack mountains. June. This species inhabits various species of compositæ, but does not appear to have been before found on *Senecio.*

GLOMERULARIA CORNI, *Pk.*

Hitherto found only on *Cornus Canadensis*, but now on *Lonicera ciliata* also. Adirondack mountains. June.

LOPHIOTREMA SPIRÆÆ, *Sacc. v. ADULTUM.*

This has the spores nine to eleven-septate. In the type they are seven-septate. West Albany. Apr.

DIAPORTHE SPICULOSA, *Nits.*

A form occurs on dead branches of *Spiræa opulifolia* without a limiting black line in the matrix. The perithecia are sunk in the wood, the surface of which becomes blackened.

HYPODERMA NERVISEQUUM, *Fr.*

Fertile specimens were found on balsam leaves in Caroga. July.

LOPHODERMIIUM PETIOLICOLUM, *Fckl. v. ACERINUM.*

Perithecia narrowly elliptical or oblong; asci subclavate, .0025 to .003 in long, .0008 to .00035 broad; spores filiform, considerably shorter than the ascus. Fallen petioles of *Acer saccharinum.* Caroga. July.

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E.

## NEW YORK SPECIES OF LACTARIUS.

LACTARIUS, *Fr.*

[*Galorrheus, Fr. Lactifluus, Hoffm.*]

Hymenophorum fleshy, vesiculose, continuous with the fleshy stem; lamellæ unequal, adnate or decurrent, acute on the edge, exuding a milky or colored juice when wounded; volva and annulus none; spores globose or broadly elliptical, white or yellowish.

The peculiar character of this genus, and one which gives to it its name, is the milky juice which pervades the flesh and especially the lamellæ of the species. It is generally white, like milk, but in some species it quickly changes color on exposure to the air, and in a few it is always colored. In some instances it is colorless or watery, but such plants are regarded by Fries as degenerate or abnormal from growing in very wet places. In very old specimens, or in very dry weather, the milk is often more scant than usual, and it sometimes fails entirely. Its presence may generally be ascertained by cutting or breaking the pileus or the lamellæ. It is better to seek it in the latter, inasmuch as it generally flows more freely from them, especially in small species, than from the pileus and stem. In some species of *Mycena* a similar milky or colored juice exists, especially in the stem, but these are abundantly distinct from the *Lactarii* by their small size, campanulate pileus and slender, hollow, cartilaginous stem. In the genus *Russula* the size, shape and texture of the species is the same as in *Lactarius*, but the milky juice\* is wanting, though the acrid taste may be present, so that the presence of the milk and the fleshy stem is sufficient to distinguish these plants from all other *Agaricini*.

The pileus is fleshy in all the species, but in some it is thin. Even when thick and compact its texture is brittle, so that it is easily broken. It is variegated in many species by more highly-colored concentric bands or zones, a character always wanting in the allied species of *Russula*. The margin of the pileus is at first inflexed or involute, and the pileus itself more or less convex, but with advancing age the margin becomes spreading or elevated, and then the pileus, being depressed in the center, presents an obconic or funnel shape. Sometimes the pileus is convex, but umbilicate or centrally depressed with its earliest appearance, in other instances it is broadly convex or nearly plane, and furnished with a small umbo or papilla.

The lamellæ are at first adnate, but by the change in the shape of the pileus, which comes from its expansion and the elevation of the margin, they become more or less decurrent. It is not uncommon to find them branched or forked, especially near the inner extremity. In color they are generally white or whitish, but this is often varied by yellowish or reddish tints as they become mature. They often change color where cut or bruised, even when the milk remains unchangeable. In some species they become pruinose or dusted by the spores when old, in others they remain naked.

The stem in many species is short and comparatively thick, in others its length equals or exceeds the diameter of the pileus. It may be equal in diameter throughout its entire length, or become gradually narrower either toward the apex or toward the base. In some species it is always solid or merely becomes spongy within when old, in others it may be either spongy within or hollow, and that too in different individuals of the same species. When it is stuffed in the young plant it is likely to be hollow in the old. In many of the species individuals sometimes occur in which it is eccentric.

The spores are globose or broadly elliptical, and more or less rough or echinulate, and they vary but little in size in the different species. Still by their slight variations in size and color they sometimes afford good specific characters, and should by no means be neglected in the study of the species.



The taste of the milk and flesh in many species is very acrid, or hot and biting like that of Cayenne pepper; in others it is mild or but tardily and slightly acrid. This character is of great utility in distinguishing the species, and it is necessary to observe it by actually tasting, but not swallowing the milk or flesh, if we would satisfactorily identify our specimens.

Several of the species are edible, others are affirmed by authors to be poisonous. In some instances authors do not agree in respect to the quality of the species, for while one affirms, for example, that *L. insulsus* and *L. piperatus* are edible, another declares them to be poisonous. It is most prudent to avoid the use of such acrid species, for although their acridity is dispelled or destroyed by cooking, they are said by Gillet to be indigestible, and only acceptable to the strongest stomachs.

Most of the Lactarii grow on the ground, a few on decaying wood. They are found in deep woods and swamps and in grassy grounds and open places. They occur in Summer and Autumn, and are most abundant in warm, showery weather. The species have been arranged by Fries in groups, depending partly on the color and quality of the milk and partly on the naked or pruinose character of the lamellæ. This latter character does not appear to me to be sufficiently constant and obvious to be satisfactory. I have, therefore, made the color of the milk the only basis of the primary grouping of our species.

### *Synopsis of the Species.*

	Milk at first bright-colored, unchangeable.....	1
	Milk at first white, changing color on exposure to the air.....	2
	Milk white or whitish, unchangeable.....	7
1	Young lamellæ and milk indigo-blue.....	Indigo.
1	Young lamellæ and milk dark-red.....	subpurpureus.
1	Young lamellæ and milk orange-red.....	deliciosus.
1	Young lamellæ and milk saffron-yellow.....	Chelidonium.
	2 Milk becoming pinkish-red.....	3
	2 Milk becoming yellow.....	4
	2 Milk becoming lilac-color.....	uvidus.
3	Pileus dingy-gray or buff-gray (partly).....	fuliginosus.
3	Pileus dingy-brown (partly).....	lignyotus.
	4 Margin of the mature pileus glabrous.....	5
	4 Margin of the mature pileus tomentose-hairy.....	6
5	Pileus distinctly spotted, taste acrid.....	chrysorheus.
5	Pileus not distinctly spotted, taste tardily acrid.....	theiogalus.
	6 Stem spotted.....	scrobiculatus.
	6 Stem not spotted.....	cilicioides.
7	Pileus viscid when moist.....	8
7	Pileus not viscid.....	13
	8 Margin of the pileus distinctly tomentose-hairy.....	torminosus.
	8 Margin of the pileus glabrous or nearly so.....	9
9	Pileus greenish-brown or yellowish-brown, tinged with green.....	sordidus.
9	Pileus some other color, glabrous and viscid.....	10
10	Pileus some shade of red or yellow.....	11
10	Pileus some other color.....	12

- 11 Pileus reddish, generally zoneless.....hysginus.  
 11 Pileus ochraceous, zoneless.....affinis.  
 11 Pileus yellow or yellowish-white, zonate.....insulsus.  
   12 Stem paler than the pileus.....trivialis.  
   12 Stem colored like the pileus.....cinereus.  
 13 Pileus minutely tomentose, pubescent or squamulose..... 14  
 13 Pileus glabrous or merely pruinose..... 21  
   14 Pileus rugose-reticulated, velvety-pubescent.....corrugis.  
   14 Pileus not rugose-reticulated..... 15  
 15 Pileus some shade of gray or brown..... 16  
 15 Pileus some shade of red or yellow..... 18  
 15 Pileus white or whitish..... 20  
   16 Plant inodorous..... 17  
   16 Plant odorous.....glyciosmus.  
 17 Pileus about one inch broad, becoming paler with age.....griseus.  
 17 Pileus more than one inch broad, not expallent (partly)...plumbeus.  
   18 Lamellæ distant (partly).....hygrophoroides.  
   18 Lamellæ close..... 19  
 19 Pileus less than two inches broad, milk white.....alpinus.  
 19 Pileus two inches or more broad, milk watery (or white).....helvus.  
   20 Surface of the pileus persistently velvety-tomentose...vellereus.  
   20 Margin of the pileus cottony-tomentose when young (partly)  
       deceptivus.  
 21 Pileus white or whitish..... 22  
 21 Pileus some other color..... 24  
   22 Lamellæ distant or subdistant..... 23  
   22 Lamellæ crowded, dichotomous.....piperatus.  
 23 Stem more than four lines thick, young pileus umbilicate (partly)  
       deceptivus.  
 23 Stem not more than four lines thick, pileus never umbilicate. albidus.  
   24 Pileus some shade of gray or brown..... 25  
   24 Pileus some shade of red or yellow..... 31  
 25 Wounds of the lamellæ becoming pinkish-red..... 26  
 25 Wounds of the lamellæ not becoming pinkish-red..... 27  
   26 Pileus dingy-gray or buff-gray (partly).....fuliginosus.  
   26 Pileus dingy-brown (partly).....lignyotus.  
 27 Wounds of the lamellæ becoming sordid-greenish..... 28  
 27 Wounds of the lamellæ not becoming sordid-greenish..... 29  
   28 Plant growing on the ground.....varius.  
   28 Plant growing on decaying wood.....parvus.  
 29 Taste mild.....Gerardii.  
 29 Taste acrid..... 30  
   30 Pileus dry, zoneless (partly).....plumbeus.  
   30 Pileus moist, generally zonate.....pyrogalus.  
 31 Lamellæ distant (partly).....hygrophoroides.  
 31 Lamellæ close or subdistant..... 32  
   32 Taste acrid..... 33  
   32 Taste mild or slightly acrid..... 34  
 33 Pileus bay-red, flesh pinkish.....rufus.  
 33 Pileus yellowish-red, flesh white.....platyphyllus.

- 34 Stem more than four lines thick.....volumus.  
 34 Stem less than four lines thick..... 35  
   35 Plant odorous.....camphoratus.  
   35 Plant inodorous..... 36  
 36 Pileus some shade of red, not becoming paler with age...subdulcis.  
 36 Pileus brown or brownish, becoming paler with age...paludinellus.

*Milk at first bright-colored, unchangeable.\**

This group corresponds to the tribe DAPETES of Fries. In Europe there are but two species belonging to it; in our State there are four, one of which, *L. deliciosus*, is common to this country and Europe. There is much similarity in our species, their most obvious differences being in color. The pileus in all is glabrous, slightly viscid when moist, more or less zonate when young and moist, but becoming paler and less clearly zonate with age. The stem is hollow, at least when old, and often adorned with spots of the same color as the milk. The color of the milk pervades the whole plant, but it is less bright and clear except in the spots and the young lamellæ. Bruises or wounds of the lamellæ are apt to become greenish, and old plants are often stained with this hue. The spores in all are yellowish, and the taste is mild or slowly and moderately acrid. Probably all are edible, but only *L. deliciosus* has been tested.

**Lactarius Indigo, Schw.**

Blue Lactarius.

Pileus at first umbilicate with the margin involute, then depressed or infundibuliform, *indigo-blue with a silvery-gray lustre*, zonate, especially on the margin, sometimes spotted, becoming paler and less distinctly zonate with age or in drying; lamellæ close, *indigo-blue*, becoming yellowish and sometimes greenish with age; stem short, nearly equal, hollow, often spotted with blue, colored like the pileus; spores subglobose, .0003 to .00035 in. long; milk *dark blue*.

Pileus 2 to 5 inches broad, stem 1 to 2 inches long, 6 to 10 lines thick.

Dry places, especially under or near pine trees. Not rare but seldom abundant. July to September.

**Lactarius subpurpureus, Peck.**

Purplish Lactarius.

Pileus at first convex, then nearly plane or subinfundibuliform, more or less spotted and zonate when young and moist. *dark-red with a grayish lustre*; lamellæ close, *dark-red*, becoming less clear and sometimes greenish-stained with age; stem equal or slightly tapering upward, soon hollow, often spotted with red, colored like the pileus, sometimes hairy at the base; spores subglobose, .00035 to .0004 in., milk *dark-red*.

Pileus 2 to 3 in. broad, stem 1.5 to 3 in. long, 3 to 5 lines thick.

Damp or mossy ground in woods and swamps. July and August.

At once known by the peculiar dark-red or purplish hue of the milk, which color also appears in the spots of the stem and in a more subdued tone in the whole plant. The color of the pileus lamellæ and stem is

\* Badham says that the milk of *L. deliciosus* changes to a green color, but I have not observed such a change.

modified by grayish and yellowish hues. In age and dryness the zones are less clear, and dried specimens can scarcely be distinguished from *L. deliciosus*.

### **Lactarius deliciosus, Fr.**

Delicious Lactarius.

*Agaricus deliciosus* L.

Pileus at first convex and subumbilicate, then nearly plane or subinfundibuliform, *yellowish-orange or grayish-orange* varied by brighter spots and zones, fading to grayish-yellow when old or dry; lamellæ close, *orange-colored* with paler reflections, less clear and often greenish-stained with age; stem nearly equal, stuffed or hollow, often spotted, colored like the pileus, sometimes hairy at the base; spores subglobose, .0003 to .0004 in.; milk *orange-colored*.

Pileus 2 to 5 in. broad, stem 2 to 4 in. long, 4 to 8 lines thick.

Woods and open places, but especially in mossy swamps. Common. July to September. Edible.

This is the most common species of its group. It grows both in wet and in dry places, and in acerose, frondose or mixed woods. It has an excellent reputation as an edible fungus. Badham says it is one of the best of fungi and that its flesh is firm, juicy, sapid and nutritious. One writer pronounces it the most delicious mushroom known. The best method of cooking is said to be, to bake three-fourths of an hour in a close covered dish, having seasoned it with pepper, salt and butter.

Badham states that the milk turns green on exposure to the air. Wounds of the flesh and lamellæ often do, but I have not observed this change in the color of the milk.

### **Lactarius Chelidonium, Peck.**

Celandine Lactarius.

Pileus at first convex, then nearly plane and umbilicate or centrally depressed, *grayish-yellow or tawny*, at length varied with bluish and greenish stains, often with a few narrow zones on the margin, lamellæ narrow, close, sometimes forked, anastomosing or wavy at the base, *grayish-yellow*; stem short, subequal, hollow, colored like the pileus; spores globose, .0003 in.; milk sparse, *saffron-yellow*; taste mild.

Pileus 2 to 3 in. broad, stem 1 to 1.5 in. long, 4 to 6 lines thick.

Sandy soil, under or near pine trees. Saratoga and Bethlehem.

The milk of this species resembles in color the juice of celandine, *Chelidonium majus*. It is paler than that of *L. deliciosus*. By this character and by the dull color of the pileus, the narrow lamellæ, short stem and its fondness for dry situations, it may be separated from the other species. Wounds of the flesh are at first stained with the color of the milk, then with blue, finally with green. A saffron color is sometimes attributed to the milk of *L. deliciosus*, which may indicate that this species has been confused with that, or that the relationship of the two plants is a closer one than we have assigned to them.

*Milk at first white, changing color on exposure to the air.*

In this group, wounds of the lamellæ and flesh generally assume the changed color of the milk after a brief exposure to the air.



**Lactarius uvidus, Fr.**

Moist Lactarius.

Pileus at first convex, then nearly plane or centrally depressed, *glabrous, viscid*, whitish, grayish-brown or livid-brown, generally with a slight tinge of pink, sometimes obscurely zonate or marked with darker spots, either with or without a small umbo; lamellæ rather narrow, thin, close, white or yellowish, becoming *lilac where cut or bruised*; stem equal or slightly tapering upward, stuffed or hollow, glabrous, viscid, whitish or pallid; spores globose or broadly elliptical, *yellowish*, .00035 to .00045 in.; milk white, *changing to lilac*, taste acrid.

Var. *magnus*. Plant large, pileus obscurely zonate or marked with darker spots more or less concentrically arranged.

Pileus 1 to 2 in. broad, stem 1.5 to 3 in. long, 3 to 6 lines thick.

Wet mossy places in woods and swamps. Adirondack mountains and Sandlake. July and August.

This species is not very common. It is readily recognized by the lilac color assumed by the milk and the wounds of the flesh and lamellæ. The variety occurs in Vermont where it was observed by Mr. A. P. Morgan.

**Lactarius chrysorheus, Fr.**

Yellow-milk Lactarius.

*Agaricus zonarius, Bolt.*

Pileus convex, umbilicate or centrally depressed, becoming infundibuliform, glabrous, *yellowish*, sometimes tinged with flesh-color, *adorned with bright-colored zones and spots*, the margin at first involute and pruinose-tomentose; lamellæ thin, close, adnate or decurrent, yellowish, some of them forked; stem equal, glabrous, hollow, white or colored like the pileus, sometimes spotted; spores subglobose, .0003 to .00035 in.; milk white, *becoming yellow*, taste acrid.

Pileus 1 to 3 in. broad, stem 8 to 15 lines long, 3 to 5 lines thick.

Thin woods or open places. Bethlehem and Sandlake. July and August. Not common.

Fries describes this species as having a dry pileus, but in our specimens it appeared to be slightly viscid when moist. The milk in the European plant is said to change color quickly, in ours the change takes place slowly. The spots of the pileus are usually small and numerous and sometimes concentrically arranged. They, as well as the zones, have a golden-yellow or pale-orange hue. They, together with the color of the pileus, distinguish this species from the next, and the change in the color of the milk separates it from *L. insulsus*. The plant described in the Twenty-third Report under this name belongs to the next species.

**Lactarius theiogalus, Fr.**

Sulphur-milk Lactarius.

*Agaricus theiogalus, Bull.*

Pileus fleshy, thin, convex, then depressed, even, *glabrous, viscid, tawny-reddish*; lamellæ adnate or decurrent, close, pallid or reddish:

stem stuffed or hollow, even, colored like the pileus; spores *yellowish, inclining to pale flesh-color*, subglobose, .0003 to .00035 in.; milk white, *changing to sulphur-yellow*, taste tardily acrid, bitterish.

Pileus 2 to 5 in. broad, stem 1 to 3 in. long, 4 to 10 lines thick.

Woods and groves. Common. July to October.

Our plant does not fully accord with the description of the species as given by Fries. The pileus is moderately thick and compact, varying from convex or nearly plane and umbilicate to depressed or infundibuliform, slightly viscid when moist, zoneless or obscurely zonate, varying in color from pale grayish-red to tawny-red or brick-red, there being a mixture of gray yellow and red not easily defined. Gillet describes the pileus as "tawny-red, clear brick-red, bistre-red or orange-yellow diversely shaded." It somewhat resembles *L. torminosus* in color, but the glabrous margin and changeable milk distinguish it. The surface of the pileus has a minutely uneven or unpolished appearance, but it is smooth to the touch. The lamellæ are sometimes forked near the stem, whitish tinged with creamy-yellow or flesh color, and they often become stained with reddish-brown when old or bruised. The stem is generally paler than the pileus. It is commonly hollow, though sometimes stuffed or spongy within. Rarely it is spotted or stained with reddish-brown. When the flesh is cut or broken it soon assumes the pale-yellow color of the exposed milk. The taste is tardily or moderately acrid, or somewhat woody and bitterish. Its less acrid taste, unspotted and more reddish pileus, distinguish it from the preceding species. According to Gillet it is pronounced edible by some authors, poisonous by others. Cordier says that the pileus is dry, that the stem is almost always stuffed, and that it passes for poisonous, but that Letellier has eaten it more than once without inconvenience.

### *Lactarius resimus*, Fr.

#### Recurved *Lactarius*.

Pileus convex and umbilicate, then infundibuliform, even, glabrous, viscid, zoneless, *whitish or pallid*, the margin at first *involute, white-tomentose*, at length spreading, naked; lamellæ decurrent, whitish; stem even or obsoletely spotted, villose, hollow, thick; milk *quickly changing to sulphur-yellow*, taste acrid.

Var. *regalis*. (*L. regalis*, Peck.) Pileus yellowish-white, the margin glabrous; stem glabrous; spores globose, .0003 in.

Pileus 4 to 6 in. broad, stem 2 to 3 in. long, 8 to 12 lines thick.

Woods. Croghan. September. Rare.

Our plant, which has been observed but once, has the margin of the pileus and the stem glabrous, but it can scarcely be more than a variety of the species, and as such we have subjoined it.

### *Lactarius scrobiculatus*, Fr.

#### Spotted-stemmed *Lactarius*.

*Agaricus scrobiculatus*, Scop. *Agaricus theiogalus*, A. & S.

Pileus convex, then nearly plane or centrally depressed, viscid when moist, zoneless or slightly zonate, *reddish-yellow or subochraceous*, the margin at first involute, then spreading, *tomentose hairy*; lamellæ thin,

close, adnate or slightly decurrent, whitish or yellowish; stem equal, stout, hollow, colored like the pileus, adorned by *suborbicular depressed spots of a brighter color*; spores *white*, .0003 to .00035 in.; milk *white, changing to sulphur-yellow*, taste acrid.

Pileus 3 to 6 in. broad, stem 1.5 to 3 in. long, 6 to 12 lines thick.

Wet, mossy ground in woods. Caroga. July. Rare.

This Lactarius is similar to the preceding in size and shape, and like that, it sometimes has the margin naked when old, but it is distinguished by its distinctly-spotted stem and more highly-colored pileus. Its color approaches that of *L. theiogalus*, but its generally hairy margin, together with its spotted stem and more acrid taste, will distinguish it from that species. It is not deemed edible.

### **Lactarius cilicioides, Fr.**

Tomentose Lactarius.

*Agaricus tomentosus*, Otto. *Agaricus crinitus*, Schæff.

Pileus broadly convex or nearly plane, umbilicate or centrally depressed, occasionally subinfundibuliform, soft, *covered with long matted hairs or tomentum*, the center sometimes becoming naked with age, *zoneless*, viscid when moist, white reddish-buff or dingy-incarnate; lamellæ rather narrow, thin, close, adnate or slightly decurrent, some of them forked, white, or tinged with yellow or incarnate; stem short, equal or tapering downward, pruinose, stuffed or hollow, *not spotted*, white or whitish; spores *white*, .00025 to .0003 in.; milk white, sparse, slowly changing to pale yellow, taste acrid.

Var. *albus*. Pileus at first white, flesh white, stem short, milk very sparse or almost none.

Pileus 1.5 to 4 in. broad, stem .5 to 1.5 in. long, 3 to 6 lines thick.

Woods and open places, especially under or near pine trees. Forestburgh, Karner, West Albany and Greig. September and October.

The tomentose Lactarius is distinguished from all our other species by its conspicuously woolly pileus. It is this character that gives name to the plant. The hairs or fibrils are long and intricately matted, and so viscid in wet weather that fragments of leaves, sticks and dirt are often found adhering to them. The variety, which is found especially on sandy soil near pine trees, is white when young, but with age it is apt to become stained with a dirty-yellow or rusty-yellow hue, especially in the center. The milk is very sparse and sometimes wanting. The stem is so short that the pileus appears to rest on the ground. In the form which grows in woods the stem is longer, and the pileus approaches the next species in color. Fries describes the stem as two to three inches long and one inch thick, but I have seen no specimens with stems so large. The plant occurs in autumn, and sometimes several successive crops appear in the same locality in one season. It is sometimes *subcæspitose*.

*Milk white or whitish, unchangeable.*

\* Pileus viscid when moist.

**Lactarius torminosus, Fr.**

Colic Lactarius. Woolly Lactarius.

*Agaricus torminosus*, Schæff. *A. necator*, Bull. *A. piperatus*, L.  
*A. barbatus*, Retz.

Pileus convex, then depressed, viscid when young or moist, yellowish-red or pale-ochraceous tinged with red or flesh color, often varied with zones or spots, the at first involute *margin persistently tomentose-hairy*; lamellæ thin, close, narrow, whitish, often tinged with yellow or flesh color; stem equal or slightly tapering downward, hollow, sometimes spotted, whitish; spores subglobose or broadly elliptical, .00035 to .0004 in., milk white, taste acrid.

Pileus 2 to 4 in. broad, stem 1.5 to 3 in. long, 4 to 8 lines thick.

Woods. Adirondack mountains and Sandlake. August.

This species differs from all the preceding by its unchangeable milk, and from all the following by the coarse tomentum or hairs of the margin of the pileus. Badham says that it is acrid and poisonous, and Gillet declares it to be deleterious and even dangerous, and that in the raw state it is a very strong drastic purgative. On the other hand Cordier states that almost all authors agree in saying that it is eaten with impunity, and that Letellier has eaten it more than once without inconvenience.

**Lactarius sordidus, Peck.**

Pileus thick, firm, convex and centrally depressed, then nearly plane or subinfundibuliform, *subglabrous*, slightly viscid when moist, *soon dry, pale yellowish-brown, tinged with sordid green*, often darker in the center; lamellæ narrow, close, white or yellowish; stem short, firm, equal or slightly tapering upward, hollow, colored like the pileus, generally spotted; spores .0003 to .00035 in.; milk white, taste acrid.

Pileus 2 to 4 in. broad, stem 1 to 2 in. long, 4 to 8 lines thick.

Woods and open places, especially under spruce and balsam trees. Adirondack mountains and Sandlake. August and September.

This species appears to resemble *L. turpis* Fr. in color, but that species differs, according to the description of Fries, in having the margin of the pileus at first villose or tomentose, the stem stuffed, attenuated downward, not spotted, and the pileus covered with a tenacious gluten. Like it, our plant has a sordid, forbidding appearance. It sometimes appears to be adorned with a few obscure fibrils or to be slightly scabrous or hairy.

**Lactarius trivialis, Fr.**

Common Lactarius.

Pileus convex, then nearly plane, umbilicate or centrally depressed, glabrous, viscid, sometimes zonate, leaden-gray, livid-cinereous or pale brown, often with a pink or lilac tint, the thin inflexed margin at first with a grayish pruinosity; lamellæ rather narrow, close, thin, adnate, sometimes forked, whitish, becoming pallid or creamy-yellow, with *dingy-greenish stains where wounded*; stem equal or slightly tapering upward, long or short, glabrous, rarely spotted, hollow, whitish, often tinged with yellow or gray, *paler than the pileus*; spores *yellowish*, .0003 to .0004 in.; milk *whitish or pale cream color*, taste acrid.



Var. *maculatus* Pileus zónate or spotted and zonate, stem sometimes spotted.

Var. *gracilis*. Pileus small, 1 to 2 in. broad, stem equal to or longer than the diameter of the pileus, often tapering upward.

Pileus 1 to 6 in. broad, stem 1 to 5 in. long, 3 to 10 lines thick.

Woods and open places Sandlake, Albany and Adirondack mountains. July to September.

A variable species. Some forms of our plant exhibit the characters attributed to the European fungus, others do not; but these forms all run together in such a way as to leave scarcely a doubt of their specific unity. I have therefore merely distinguished two of these forms as varieties. In all the forms the pileus is sometimes zonate, and in one it is spotted, though Fries describes the pileus as "azonate" and the stem as "immaculate." In the variety *maculatus* a zonate pileus and spotted stem are sometimes united in the same plant. This form occurred in low woods in Gansevoort. The plants were large and the stem long. The variety *gracilis* was found in woods in Greig, and is so small and slender that it appears like a distinct species, yet exhibits the essential specific characters. The thin pellicle of the pileus is separable and the whitish flesh has a dingy or grayish hue immediately beneath it. The plant is sometimes cæspitose.

### **Lactarius hysginus, Fr.**

Reddish Lactarius.

*Agaricus vietus*, Krombh.

Pileus rigid, at first convex, then nearly plane, umbilicate or slightly depressed, even, viscid, zoneless or rarely obscurely zonate, *reddish-incarnate*, *tan-color* or *brownish-red*, becoming paler with age, the thin margin inflexed; lamellæ close, adnate or subdecurrent, whitish, becoming yellowish or cream colored; stem equal, glabrous, stuffed or hollow, colored like the pileus, or a little paler, sometimes spotted; spores subglobose, *whitish on black paper*, *yellowish on white paper*, .00035 to .0004 in.; milk white, taste acrid.

Pileus 2 to 3 in. broad, stem 1 to 2 in. long, 4 to 8 lines thick.

Woods. Sandlake and Caroga. July and August. Not common.

The reddish hue of the pileus distinguishes this species from its allies. The gluten or viscosity of the pileus in our specimens was rather tenacious and persistent.

### **Lactarius affinis, Peck.**

Related Lactarius.

Pileus convex and centrally depressed, glabrous, viscid, *zoneless*, *ochraceous-yellow*; lamellæ rather broad, subdistant, whitish or creamy-yellow, some of them forked; stem equal, glabrous, stuffed or hollow, colored like the pileus, often spotted; spores .00035 to .00045 in.; milk white, taste acrid.

Pileus 2 to 4 in. broad, stem 1 to 2 in. long, 6 to 12 lines thick.

Pastures and coves. Catskill mountains. October. Rare.

I have observed this species but once. Mr. Morgan has found a stout form of it in Vermont. In his specimens the stem is conspicuously spotted, in the New York specimens sparingly. The species is

closely related to *L. insulsus*, but apparently distinct by its darker color, broader, looser lamellæ and zoneless pileus. It appears to be intermediate between that species and *L. hyginus*.

### **Lactarius insulsus, Fr.**

Unsavory Lactarius.

*Agaricus flexuosus*, Secr.

Pileus convex and umbilicate, then infundibuliform, glabrous, viscid, more or less zonate, yellowish, the margin naked; lamellæ thin, close adnate or decurrent, some of them forked at the base, whitish or pallid; stem equal or slightly tapering downward, stuffed or hollow, whitish or yellowish, generally spotted; spores .0003 to .00035 in.; milk white, taste acrid.

Pileus 2 to 4 in. broad, stem 1 to 2 in. long, 4 to 6 lines thick.

Thin woods and open, grassy places. Greenbush and Sandlake. July and August.

Our plant has the pileus pale yellow or straw color, and sometimes nearly white, but European forms have been described as having it orange-yellow and brick-red. It is generally, though often obscurely, zonate. The zones are ordinarily more distinct near the margin, where they are occasionally very narrow and close. The milk in the Greenbush specimens had a thin, somewhat watery appearance. Authors differ in their estimate of its qualities, some affirming that it is edible, others that it is poisonous. It is classed as edible in the Curtis Catalogue, and Cordier says that it appears to be edible.

### **Lactarius cinereus, Peck.**

Cinereous Lactarius.

Pileus thin, nearly plane and umbilicate or subinfundibuliform, glabrous, viscid, pale gray or cinereous, the disk sometimes darker colored; lamellæ narrow, close, white; stem equal or slightly tapering upward, stuffed, sometimes tomentose at the base, colored like the pileus; spores white, .00028 to .0003 in.; milk white, taste acrid.

Pileus 1 to 2 in. broad, stem 1 to 3 in. long, 3 to 4 lines thick.

Woods. Sandlake and Greig. August and September.

The species is evidently closely allied to *L. vietus* Fr., but I have never seen the pileus umbonate or expallent, nor the milk become gray, characters attributed to that species. In our plant the viscid pellicle is separable. In shape and size it resembles *L. trivialis* v. *gracilis*, but its paler usually umbilicate pileus, concolorous stem and white spores separate it. Mr. Morgan finds, in Vermont, a somewhat larger form with the pileus sometimes zonate.

\*\* Pileus not viscid.

† *Pileus minutely tomentose or squamulose.*

### **Lactarius griseus, Peck.**

Gray Lactarius.

Pileus thin, nearly plane, broadly umbilicate or centrally depressed, sometimes infundibuliform, generally with a small umbo or papilla,

*minutely squamulose tomentose*, gray or brownish-gray, becoming paler with age; lamellæ thin, close, adnate or slightly decurrent, whitish or yellowish; stem slender, equal or slightly tapering upward, rather fragile, stuffed or hollow, generally villose or tomentose at the base, paler than or colored like the pileus; spores .0003 to .00035 in.; milk white, taste subacid.

Pileus 6 to 18 lines broad, stem 1 to 2 in. long, 1 to 3 lines thick.

Woods and swamps on much decayed wood and mossy ground. Common. July to September.

The relationship of this species is with *L. mammosus* Fr., from which it differs in its lamellæ, which do not become ferruginous, and in its stem which is not pubescent, though it generally has long coarse tomentose hairs at its base. Its habitat also is peculiar, being much decayed mossy prostrate trunks or damp mossy vegetable mold in woods and swamps. It bears some resemblance to *L. cinereus* in form and color, but it is generally smaller, and easily distinguished by its dry tomentulose pileus.

### **Lactarius glyciosmus,**

Fragment Lactarius. Scented Lactarius.

Pileus thin, convex nearly plane or depressed, often with a small umbo or papilla, *minutely squamulose*, cinereous, grayish-brown or smoky-brown, sometimes tinged with pink, the margin even or slightly and distinctly striate; lamellæ narrow, close, adnate or decurrent, whitish or yellowish; stem equal, glabrous or obsoletely pubescent, stuffed, rarely hollow, whitish or colored like the pileus; spores .0003 to .00035 in.; milk white, taste acrid and unpleasant, sometimes bitterish, odor *aromatic*.

Pileus 6 to 18 lines broad, stem 6 to 18 lines long, 1 to 3 lines thick.

Woods and open places on the ground and on decaying wood Adirondack mountains, West Albany and Karner. September and October.

The distinctive characters of the species are its small size, squamulose pileus and agreeable odor. This is described by European authors as spirituous or like that of alcohol, but to me it resembles rather that of dry melilot and is not much unlike that of *L. camphoratus*. The American plant, so far as observed, does not have the red hues ascribed to the European.

### **Lactarius alpinus, Peck.**

Alpine Lactarius.

Pileus thin, convex or nearly plane, sometimes centrally depressed, occasionally with a small umbo or papilla, tomentose or squamulose, *tawny-ochraceous*; lamellæ close, adnate or decurrent, yellowish; stem equal or slightly tapering upward, glabrous, solid or stuffed, paler than or colored like the pileus; spores .0003 to .00035 in.; milk *white*, taste acrid.

Pileus 8 to 18 lines broad, stem 12 to 18 lines long, 2 to 3 lines thick Summit of Haystack mountain and Karner. August. Rare.

Apparently allied to *L. helvus* Fr., but so much smaller that I can scarcely think it the same species and have for the present kept it distinct. The plants resemble *L. subdulcis* in size and somewhat in color,

but differ in their squamulose pileus. The specific name proves to be inappropriate, as the species has been found in a much lower region than that of its original discovery.

### **Lactarius helvus, Fr.**

Pale-red Lactarius.

Pileus fleshy, *fragile*, convex, then plane or depressed, subumbonate, dry, *silky or floccose-squamulose* and rivulose, *pale-testaceous*, becoming paler; lamellæ decurrent, thin, close, whitish-ochraceous; stem stuffed or hollow, *pruinose-pubescent*; milk sparse, subacid, white.

Var. *aquifluus*. *L. aquifluus* Peck. Milk sparse, *watery*, taste mild or subacid, spores .0003 to .00035 in.; odor weak in the fresh plant, more decided in the dried specimens, aromatic and agreeable.

Pileus 2 to 6 in. broad, stem 3 to 6 in. long, 4 to 10 lines thick.

Mossy ground in swamps and marshes. Adirondack mountains, Sandlake and Karner. July and August.

Our specimens agree so closely with the description of *L. helvus*, as given by Fries, and of which a translation is here given, that we have referred them to that species, distinguishing them merely as a variety on account of the watery milk. Fries regards such a milk as belonging to a degenerate or abnormal state of the species, and the result of too much moisture. But unless *L. alpinus*, shall prove to be a dwarf form of *L. helvus*, only this form of the species has been detected within our limits and indeed in this country. It scarcely seems probable that a species would occur constantly and repeatedly, in various widely separated localities, in a degenerate condition only. It would seem probable that occasionally, in a dry time or in a more dry locality, it would revert to its normal condition. But this has not yet been observed to happen in our plant, therefore we have preferred to consider it a variety. The milk sometimes presents a slightly turbid appearance, less clear than water. The pileus becomes quite fragile when old, and the thin margin is then spreading and sometimes flexuous. The color is a grayish-red or pale tawny-red. The stem is nearly equal, but in young plants it is often narrowed toward the apex. It is glabrous or pruinose and soon hollow, often a little paler than the pileus and slightly striate at the apex from the decurrent lamellæ. The flesh is tinged with pink or a pale pinkish-gray. The plant is sometimes cæspitose.

### **Lactarius vellerius, Fr.**

Fleecy Lactarius.

*Agaricus Listeri* Sow. *A. piperatus* Poll.

Pileus compact, at first convex and umbilicate, then expanded and centrally depressed or subinfundibuliform, the *whole surface minutely velvety-tomentose, soft to the touch*, white or whitish, the margin at first involute, then reflexed; lamellæ *distant or subdistant*, adnate or decurrent, sometimes forked, whitish becoming yellowish or cream-colored; stem firm, solid, equal or tapering downward, *pruinose-pubescent*, white; spores white, *nearly smooth*, .0003 to .00035 in.; milk white, taste acid.

Pileus 2 to 5 in. broad, stem .5 to 2 in. long, 6 to 16 lines thick.

Woods and open places. Common. July to September.



The soft downy tomentum which is characteristic of this species and which covers the whole pileus gives it a pruinose appearance when viewed from a little distance. The stem is generally short and is sometimes broader than long. The lamellæ vary in width from two to four lines and are generally about equal in width to the thickness of the pileus. They become stained where bruised. The milk, which is sometimes quite abundant in wet weather, exudes from wounds and dries into cream-colored gummy granules. The taste is very acrid. Cordier states that it is poisonous according to some authors, edible according to Leveille.

### **Lactarius deceptivus, Peck.**

#### Deceptive Lactarius.

Pileus compact, at first convex and umbilicate, then expanded and centrally depressed or subinfundibuliform, *obsoletely tomentose or glabrous* except on the margin, white or whitish, often varied with yellowish or sordid stains, the margin at first involute and *clothed with a dense, soft or cottony tomentum*, then spreading or elevated and more or less fibrillose; lamellæ rather broad, distant or subdistant, adnate or decurrent, some of them forked, whitish, becoming cream colored; stem equal or narrowed downward, solid, pruinose-pubescent, white; spores white, .00035 to .0005 in.; milk white, taste acrid.

Pileus 3 to 5 in. broad, stem 1 to 3 in. long, 8 to 18 lines thick.

Woods and open places, especially under hemlock trees. Common. July to September.

This plant appears to have been confused with *L. vellereus*, which it closely resembles, but from which it appears to me to be quite distinct, both in the character of the tomentum of the pileus and in its decidedly larger and rougher spores. The young pileus is clothed with a thin, silky tomentum, which, on the involute margin, is quite thick, but very soft and cottony, and sometimes striated with parallel impressions, produced by previous pressure against the edges of the lamellæ. In the mature plant the pileus appears nearly or quite glabrous, or is merely shaggy fibrillose on the margin. Sometimes the cuticle seems to be slightly rimose, and the surface then has a kind of scaly appearance. The lamellæ are as broad and distant as in *L. vellereus*, but the stem is generally a little longer in the present species than it is in that. The glabrous form of this species was referred to *L. piperatus* in the Twenty-third Report. An experiment of its edible qualities was made without any evil consequences. The acidity was destroyed by cooking.

†† *Pileus glabrous or merely pruinose or pruinose-pubescent, not squamulose.*

### **Lactarius piperatus, Fr.**

#### Peppery Lactarius.

*Agaricus piperatus*, Scop. *A. acris*, Bull. *A. Listeri*, Krombh.

Pileus compact, at first convex and umbilicate, then expanded and centrally depressed or infundibuliform, even, *glabrous*, white; lamellæ *narrow, crowded, dichotomous*, adnate or decurrent, white or cream colored; stem equal or slightly tapering downward, solid, glabrous,

white; spores white, nearly smooth, .00025 to .0003 in.; milk white, abundant, taste very acrid.

Pileus 1.5 to 4 in. broad, stem .5 to 2 in. long, 5 to 10 lines thick.

Thin woods, pastures and grassy places. Common. July to September.

The glabrous or sometimes merely pruinose pileus, the crowded and frequently forked narrow lamellæ separate this species from the other white ones. The lamellæ are one to two lines broad, their width being less than the thickness of the flesh of the pileus. The stem is either very short or quite long, according to the place of growth, it being longer when growing in woods among fallen leaves than when growing in open grassy places. In the summer of 1883 this and the two preceding species were abundant in the town of Sandlake, and all grew in the same locality. By a little practice they were readily distinguishable, even without a close inspection.

Most authors agree in attributing edible qualities to this species, notwithstanding its intense acidity. Badham says that he has frequently eaten it, and that according to Berkeley it is preserved for winter use by pickling in salt and vinegar. Cordier says that it is an agreeable aliment and is eaten in many countries, and that cows eat it with avidity, but that it renders their milk and butter nauseous. Fries says it is edible, and it is so classed in Curtis' Catalogue. Gillet states that although it does not constitute an agreeable article of food, it is eaten in some parts of France, and that the Russians make frequent use of it.

### **Lactarius albidus, Peck.**

#### White Lactarius.

Pileus *thin*, plane or slightly depressed, glabrous, dry, white; lamellæ *subdistant*, adnate or slightly decurrent, white, the *interspaces venose*; stem equal, solid, glabrous, white; spores white, .0003 to .00035 in.; milk white, taste acrid.

Pileus 1.5 to 3 in. broad, stem 1 to 2 in. long, 3 to 5 lines thick.

Thin woods. Karner. September. Very rare.

This Lactarius has been observed but once, and then but few specimens were seen, yet it appears to be distinct from all our other white species in its thin pileus, subdistant lamellæ, venose interspaces and rather slender stem. Except in color, it has some similarity to the next species.

### **Lactarius varius, n. sp.**

#### Variable Lactarius.

Pileus thin, convex or nearly plane, umbilicate or centrally depressed, sometimes with a minute umbo or papilla, *glabrous*, even or obscurely roughened, submoist, zoneless or rarely narrowly zonate on the margin, *gray or brown, often tinged with lilac*, lamellæ close, adnate or subdecurrent, whitish or cream colored, becoming dingy-greenish where wounded; stem equal, elastic, glabrous, solid or spongy within, paler than or colored like the pileus; spores white, .0003 to .00035 in.; milk white, taste tardily acrid, *odor none*, flesh white.

Pileus 1 to 2.5 in. broad, stem 1 to 2.5 in. long, 2 to 4 lines thick.

Thin woods and moist places. West Albany and Karner. September.

A very variable species. The prevailing color of the pileus is gray or lead-gray, but it is often lilac-brown. Its surface has a moist and shining appearance, but it is sometimes seen under a lens to be roughened by minute pits or depressions, in which case it presents silvery or sparkling reflections as if micaceously atomate. It often grows with *L. glycosmus* from which it is distinguished by its glabrous pileus and lack of odor. It also approaches *L. plumbeus*, but differs from it in its smaller size, paler color, moist appearance and larger spores. Wounds of the lamellæ assume a hue similar to that seen under similar circumstances in *L. trivialis*.

### **Lactarius parvus, Peck.**

Small Lactarius.

Pileus nearly plane or depressed, *even*, glabrous, *zoneless*, reddish-brown or lilac-brown, *becoming paler with age*, lamellæ narrow, crowded, white or yellowish, becoming dingy-greenish where wounded; stem equal or slightly tapering upward, often curved, stuffed, whitish; spores globose, white, .0003 to .0004 in.; milk white, taste acrid.

Pileus 6 to 12 lines broad, stem 6 to 12 lines long, 1 to 2 thick.

Old stumps and prostrate trunks in woods. Sandlake, Osceola and Greig. August and September.

This small species is closely allied to *L. varius*, of which it might be considered a mere variety. It differs in being smaller, in having the pileus constantly even, zoneless, destitute of an umbo or central papilla and in growing paler with age. I have only found it growing on decaying wood. When growing on the sides of stumps and prostrate trunks, the stem is often curved and sometimes eccentric.

### **Lactarius plumbeus, Fr.**

Lead-colored Lactarius.

*Agaricus plumbeus*, Bull.

"Pileus compact, convex, then infundibuliform, dry, unpolished *fuliginous or brownish-black*; lamellæ crowded, white or yellowish; stem solid, equal, thick; milk white, acrid, *unchangeable*," spores .00025 to .0003 in.

Pileus 2 to 5 in. broad, stem 1.5 to 3 in. long, 3 to 6 lines thick.

The specimens which I have referred to this species were found in the Catskill mountains several years ago, growing in hemlock woods, under spruce and balsam trees. I have not met with the species since. The pileus in the larger specimens had a minutely tomentose appearance, but in the dried specimens this has disappeared. They also varied in color from blackish-brown to pinkish-brown and grayish-brown, but they can scarcely be more than a mere form or variety of the species the description of which, as given by Fries, I have quoted. In the Handbook the pileus is described as dark fuliginous gray or brown, and Gillet describes it as black-brown, dark fuliginous or lead-color, and adds that the plant is poisonous and the milk very acrid and burning. Cor dier says that the flesh is white and the taste bitter and disagreeable.

**Lactarius pyrogalus, Fr.**

Caustic Lactarius.

*Agaricus pyrogalus*, Bull. *A. rusticanus*, Scop.

Pileus broadly convex, plane or slightly depressed, sometimes umbilicate, glabrous, even, *submoist*, *generally zonate*, livid-cinereous, grayish-brown or lilac-brown; lamellæ thin, *distant or subdistant*, adnate or subdecurrent, *yellowish*; stem equal or slightly tapering downward, glabrous, stuffed or hollow, paler than or colored like the pileus; spores globose, *yellowish*, .0003 to .00035 in.; milk white, taste acrid.

Pileus 1.5 to 2.5 in. broad, stem 1 to 1.5 in. long, 2 to 4 lines thick.

Thin woods and open places. Sandlake, Greenbush and Karner. August to October.

The zonate pileus, distant lamellæ and yellowish spores separate this species from its allies. The milk is copious and very acrid and the species is regarded as poisonous. Cordier states that the milk is mild in young plants, acrid in mature ones.

**Lactarius fuliginosus, Fr.**

Dingy Lactarius.

*Agaricus azonites*, Bull. *A. plinthogalus*, Otto. *L. fumosus*, Pk.

Pileus firm becoming soft, convex plane or slightly depressed, even, *dry*, zoneless, *dingy-cinereous or buff-gray*, appearing as if covered with a dingy pruinosity, the margin sometimes wavy or lobed; lamellæ adnate or subdecurrent, subdistant, whitish, then yellowish, becoming *stained with pink-red or salmon color where wounded*; stem equal or slightly tapering downwards, firm, stuffed, colored like the pileus; spores globose, *yellowish*, .0003 to .0004 in.; milk white, taste tardily and sometimes slightly acrid.

Pileus 1 to 2.5 in. broad, stem 1 to 2 in. long, 3 to 5 lines thick.

Thin woods and open grassy places. Greenbush and Sandlake. July and August.

The pileus, in this species, has a peculiar dingy or smoky hue which is suggestive of the specific name. The color is a pale-cinereous or yellowish-gray compared by some authors to the color of coffee and milk. This and the yellowish color of the spores, the tardily acrid taste and the pinkish hue of the wounds of the lamellæ and flesh characterize the species. Both Fries and Gillet state that the milk, as well as wounds of the flesh, changes to a pinkish or saffron hue on exposure to the air. This would transfer the place of the species to our second group, for which we have made provision in the synoptical table. But we have failed to verify this character in our plant, and consequently it was formerly supposed to be distinct from the European, and was published under the name *Lactarius fumosus*. But inasmuch as the European plant has also been described as having white unchangeable milk, and since our plant agrees in every other respect with the description given by Fries, it is quite probable that the species may vary in this respect and we have therefore referred our plant to it. Cordier states that according to Barla and Reveil this species is poisonous.



**Lactarius lignyotus, Fr.**

## Sooty Lactarius.

Pileus broadly convex plane or slightly depressed, dry, with or without a small umbo, generally rugose-wrinkled, *dark-brown, appearing subpulverulent or as if suffused with a dingy pruinosity*, the margin sometimes crenately lobed and distinctly plicate; lamellæ moderately close or subdistant, adnate, white or yellowish, *slowly changing to pinkish-red or salmon color where wounded*; stem equal or abruptly narrowed at the apex, even, glabrous, stuffed, colored like the pileus, sometimes plicate at the top; spores globose, *yellowish*, .00035 to .00045 in.; milk white, taste mild or tardily and slightly acid.

Var. *tenuipes*. Pileus about 1 inch broad, stem slender, 2 to 3 in. long and about two lines thick.

Pileus 1 to 4 in. broad, stem 1 to 3 in. long, 2 to 6 lines thick.

Wet or mossy ground in woods and swamps. Adirondack mountains and Sandlake. July and August. Not rare in hilly and mountainous districts.

The sooty Lactarius is closely related to the preceding species with which it was formerly united by Fries as a variety, but from which it may be distinguished by its larger size, darker color and generally rugose-wrinkled pileus. Wounds of the flesh and lamellæ slowly change color as in that species, and, according to the description given by Fries, the milk also undergoes a similar change, but I have not been able to verify this in the American plant. According to the description of *L. subtomentosus*, B. & R., the milk in that plant changes from white to yellowish and the taste is acid. In the Twenty-third Report our plant was erroneously referred to that species.

**Lactarius Gerardii, Peck.**

## Gerard's Lactarius.

Pileus broadly convex plane or slightly depressed, dry, generally rugose-wrinkled, with or without a small umbo or papilla, *dingy-brown*, the thin spreading margin sometimes flexuous lobed or irregular; lamellæ *distant*, adnate or decurrent, *white or whitish*, the interspaces generally uneven; stem subequal, stuffed or hollow, colored like the pileus; spores globose, *white*, .00035 to .00045 in.; milk white, *unchangeable*, taste *mild*.

Pileus 1.5 to 4 in. broad, stem 1 to 2 in. long, 3 to 6 lines thick.

Woods and open places. Poughkeepsie. *W. R. Gerard*. Greenbush, Sandlake and Croghan. July to September.

This Lactarius closely resembles the sooty Lactarius in color, but differs from it in its more distant lamellæ, white spores and constantly mild taste. Wounds of the flesh and lamellæ do not become pinkish-red as in that plant. From the next species its darker color, hollow stem and more globose rougher spores separate it.

**Lactarius hygrophoroides, B. & C.**

Hygrophorus-like Lactarius. Distant-gilled Lactarius.

*Lactarius distans*, Pk.

Pileus firm, convex or nearly plane, umbilicate or slightly depressed, rarely infundibuliform, glabrous or sometimes with a minute velvety

pubescence or tomentum, dry, sometimes rugose-wrinkled and often becoming rimose-areolate, *yellowish-tawny or brownish-orange*; lamellæ *distant*, adnate or subdecurrent, white or cream-color, the interspaces uneven or venose; stem short, equal or tapering downward, *solid*, glabrous or merely pruinose, colored like the pileus; spores subglobose or broadly elliptical, *nearly smooth*, .00035 to .00045 in.; milk white, taste mild.

Pileus 1 to 4 in. broad, stem .5 to 1 in. long, 4 to 8 lines thick.

Grassy ground and borders of woods. Albany, Greenbush and Sand-lake. July and August.

This plant has almost exactly the color of *L. volemus*, but differs from it in its distant lamellæ, short stem, less copious milk and less globose spores. Its flesh is white, with a thickness about equal to the breadth of the lamellæ. It is probably edible, but has not yet been tested. The typical *L. hygrophoroides* is described as having the pileus yellowish-red and pulverulent, and the lamellæ luteous. It is also represented as a small plant; but our specimens, while not fully agreeing with this description, approach so closely to it in some of their forms that they doubtless belong to the same species. We have therefore extended the description so that it may include our plant. In wet weather the pileus sometimes becomes funnel-form by the elevation of the margin.

### **Lactarius volemus, Fr.**

Orange Lactarius. Orange-brown Lactarius.

*Agaricus testaceus*, A. & S. *A. ruber*, Secr.

Pileus firm, convex nearly plane or centrally depressed, rarely infundibuliform, sometimes with a small umbo, generally even, *glabrous*, dry, *golden-tawny or brownish-orange*, sometimes darker in the center, often becoming rimose-areolate; lamellæ *close*, adnate or subdecurrent, white or yellowish, becoming sordid or brownish where bruised or wounded; stem subequal, variable in length, firm, solid, glabrous or merely pruinose, colored like the pileus, sometimes a little paler; spores *globose*, white, .00035 to .00045 in.; milk *copious*, white, taste acid.

Var. *subrugosus*. Pileus rugose-reticulated on the margin.

Pileus 2 to 5 in. broad, stem 1 to 4 in. long, 4 to 10 lines thick.

Thin woods and open places. Common. July to September. Edible.

The color of the pileus is a peculiar mixture of red and yellow, sometimes shaded with brown. It is generally free from the attacks of insects, and this, with its beautiful and nearly uniform color, makes it an attractive species. It is nearly as celebrated as *L. deliciosus* for its edible qualities. Cordier says "it is one of the most agreeable fungi to eat." Its flesh is firm but brittle, white or yellowish. Its milk is very abundant and its taste mild or slightly astringent. In drying, the specimens sometimes emit a disagreeable odor. We have followed Fries and other continental mycologists in writing the specific name "*volemus*." Some English authors have it "*volemum*." The variety connects this species with the next.

### **Lactarius corrugis, Peck.**

Corrugated Lactarius.

Pileus firm, convex, then nearly plane or centrally depressed, *rugose reticulated*, covered with a *velvety pruinosity or pubescence*, *dark*

*reddish-brown or chestnut color*, fading with age to tawny-brown; lamellæ close, dark cream color or subcinnamon, *becoming paler* when old, sordid or brownish where bruised or wounded, stem equal, solid, glabrous or merely pruinose, paler than but similar in color to the pileus; spores subglobose, .0004 to .0005 in., milk copious, white, taste mild.

Pileus 3 to 5 in. broad, stem 3 to 5 in. long, 6 to 12 lines thick.

Thin woods. Sandlake, Gansevoort and Brewerton. August and September.

This curious *Lactarius* is related to *L. volemus*, from which it may be separated by its darker colors and its corrugated pileus. The flexuous reticulated rugæ present an appearance similar to that of the hymenium of a *Merulius*. The pileus is everywhere pruinose-pubescent and the lamellæ bear numerous spine-like or acicular cystidia or spicules, .0016 to .002 in. long. These are so numerous on and near the edges of the lamellæ that they give them a pubescent appearance.

### ***Lactarius platyphyllus*, Peck.**

Broad-gilled *Lactarius*.

Pileus depressed or subinfundibuliform, glabrous, zoneless, *yellowish-incarnate or yellowish-red*, the decurved or spreading margin sometimes wavy or flexuous; lamellæ *broad*, subdistant, yellowish; stem equal, stout, *hollow*, paler than or colored like the pileus; spores subglobose or broadly elliptical, .00035 to .00045 in.; milk white, taste acrid.

Pileus 4 to 8 in. broad, stem 3 to 5 in. long, 6 to 12 lines thick. Woods. North Elba. August.

This large species is apparently very rare. It has been observed but once, and then in dry weather, so that it was not positively ascertained whether the pileus may not be viscid when moist. Its real position is, therefore, uncertain. The lamellæ are four or five lines broad and the flesh is white or whitish.

### ***Lactarius rufus*, Fr.**

Red *Lactarius*.

*Agaricus rufus*, Scop.

Pileus convex and centrally depressed, then infundibuliform, generally with a small umbo, glabrous, sometimes slightly floccose or pubescent when young, especially on the margin, zoneless, *bay-red or brownish-red*, shining; lamellæ narrow or moderately broad, sometimes forked, close, subdecurrent, yellowish or reddish; stem nearly equal, firm, stuffed, paler than or colored like the pileus; spores white, .0003 to .0004 in.; milk white, taste very acrid.

Pileus 2 to 4 in. broad, stem 2 to 4 in. long, 3 to 5 lines thick.

Low woods and swamps. North Elba. August. Rare.

The red *Lactarius* is known by its rather large size, dark-red pileus and intensely acrid taste. It has been found but once in our State. The flesh is pinkish and the stem sometimes pruinose. It is designated by authors as very poisonous and extremely poisonous. Cordier even says that worms never attack it.

**Lactarius camphoratus, Fr.**

Camphor Lactarius.

*Agaricus camphoratus, Bull.*

Pileus thin, convex, then nearly plane or depressed, generally with a small umbo or papilla, glabrous, *bay-red or brownish-red*, sometimes zonate, the spreading margin occasionally wavy or flexuous; lamellæ narrow, thin, close, yellowish or dull reddish; stem subequal, glabrous, stuffed or hollow, colored like the pileus; spores globose, white, .0003 to .00035 in.; milk white, taste *mild*, odor *agreeable, aromatic*.

Pileus .5 to 1.5 in. broad, stem 1 to 2 in. long, 2 to 3 lines thick.

Swamps and wet places, also in woods. Sandlake and Adirondack mountains. July to September.

This plant resembles the preceding species in color, but it differs from it decidedly in size and in taste. The European plant is described as subzonate, but I have seen no zonate specimens. The color of the lamellæ, when old, resembles that of the pileus, though they are paler. The odor is not like that of camphor, as the name would seem to imply. To me it resembles that of dried *Cyperus inflexus* or dried melilot. It is often weak in the fresh plant, but becomes more distinct in the dried specimens, which retain it a long time. Gillet gives the species as edible.

**Lactarius subdulcis, Fr.**

Sweet Lactarius. Sweetish Lactarius.

*Agaricus subdulcis, Bull.*

Pileus thin, convex, then plane or subinfundibuliform, with or without a small umbo or papilla, glabrous, even, zoneless, moist or dry, tawny-red, cinnamon-red or brownish-red, the margin sometimes wavy or flexuous; lamellæ rather narrow, thin, close, whitish, sometimes tinged with red; stem equal or slightly tapering upward, slender, glabrous, sometimes villous at the base, stuffed or hollow, paler than or colored like the pileus; spores globose, white, .0003 to .00035 in.; milk white, taste mild or tardily and slightly acid, sometimes woody or bitterish and unpleasant, flesh whitish, pinkish or reddish-gray, odor *none*.

Pileus .5 to 2 in. broad, stem 1 to 2.5 in. long 1 to 3 lines thick.

Fields, copses, woods, swamps and wet places. July to October. Very common.

This species grows in almost every variety of soil and locality. It may be found in showery weather on dry, rocky soil, on bare ground or among mosses or fallen leaves. In drier weather it is still plentiful in swamps and wet, shaded places, and in sphagnous marshes. It sometimes grows on decaying wood. It is also as variable as it is common. Gillet has described the following varieties.

Var. *cinnamomeus*. Pileus cinnamon-red, subshining; stem stuffed, then hollow; taste mild, becoming slightly acid or bitter.

Var. *rufus*. Pileus dull chestnut-red, becoming more concave; stem spongy; taste mild.

Var. *badius*. Pileus bay-red, shining as if varnished, with an obtuse disk and an inflexed, elegantly crenulate margin, stem very glabrous, hollow.



The first and second varieties have occurred within our limits. The first also has the stem elastic and furnished with a whitish or grayish tomentum or strigose villosity at the base, when growing among moss in swamps. A form occurred in Sandlake, in which some of the specimens were proliferous. The umbo had developed into a minute pileus. With us the prevailing color of the pileus is yellowish-red or cinnamon-red. Sometimes the color is almost the same as that of *L. volenus* and *L. hygrophoroides*, and again it is a tan color or a bay red, as in *L. camphoratus*, from which such specimens are scarcely separable, except by their lack of odor. In young plants the pileus usually has a moist appearance, which is sometimes retained in maturity. Cordier pronounces the species edible, and says that he has tested it several times without inconvenience.

### **Lactarius paludinellus, n. sp.**

Little marsh Lactarius.

Pileus thin, plane or slightly depressed, striatulate on the margin, glabrous, generally with a small blackish umbo or papilla, at first *dingy brown, becoming paler with age*; lamellæ moderately close, adnate or slightly decurrent, cream colored; stem nearly equal, stuffed or hollow, glabrous, with a white strigose-villosity at the base, paler than or colored like the pileus; spores .0003 to .00035 in.; milk white, taste mild.

Pileus 6 to 12 lines broad, stem 10 to 18 lines long, 1.5 to 2 thick.

Among sphagnum, in shaded marshes. Sandlake. August.

A small and rare species, related to but distinct from *L. sublucis* by its brownish expellent pileus and striatulate margin.

## **NEW YORK SPECIES OF PLUTEUS.**

### **PLUTEUS, Fr.**

Hymenophorum distinct from the fleshy or fleshy-fibrous stem, lamellæ rounded behind, free, at first crowded, white or yellowish, then flesh-colored; annulus and volva none.

The Plutei, in the pink-spored series of Agarics, correspond very nearly in structure to the Lepiotæ in the white-spored series. They differ from the Lepiotæ in having no annulus; and by its absence they are distinguished from the Annulariæ of their own series, and by the absence of a volva, from the Volvariæ. By their free lamellæ they are readily separated from all other pink-spored Agarics. The species are generally of medium or moderately small size. Nearly all inhabit decaying wood in groves or in the shades of forests, but the common Fawn Agaric, *P. cervinus*, is often found on old stumps in open situations where it is exposed to the full light of the sun. The pileus may be floccose-fibrillose, pruinose-pulverulent or glabrous, and by these characters Fries has separated the species into three groups. In some species the central part of the pileus is more or less rugose-wrinkled or uneven. The lamellæ are at first compactly crowded (cohærent) very

much as in some species of *Coprini*, and in some species they are apt to become moist or almost deliquescent, especially in damp weather. Their color is generally white or yellowish-white when young, but they soon assume the salmon hue of the spores. They generally yield these readily and in great abundance. The spores, in our species, are even, with a single exception, and generally subglobose or broadly elliptical.

None of the species are very abundant with us and none are classed as edible.

### *Synopsis of the Species.*

Pileus glabrous .....	1
Pileus not glabrous.....	2
2 Pileus white.....	3
2 Pileus not white.....	5
3 The margin not surpassing the lamellæ.....	4
3 The thin margin surpassing the lamellæ.....	sterilomarginatus.
4 Stem glabrous or merely fibrillose (partly) .....	cervinus.
4 Stem pubescent or subtomentose .....	tomentosulus.
5 Pileus even or rarely with short marginal striations.....	6
5 Pileus with long marginal striations .....	longistriatus.
6 Pileus fibrillose or villose on the disk.....	7
6 Pileus pulverulent pruinose or granulose .....	8
7 Lamellæ concolorous on the edge (partly) .....	cervinus.
7 Lamellæ darker-colored on the edge.....	umbrosus.
8 Stem velvety-pubescent.....	granularis.
8 Stem glabrous.....	nanus.
1 Pileus even (partly).....	cervinus.
1 Pileus striate on the margin .....	leoninus.
1 Pileus rugose-reticulate on the disk.....	admirabilis.

### *Pluteus cervinus, Schæff.*

Fawn-colored Agaric. Fawn *Pluteus*.

Pileus fleshy, at first campanulate, then convex or expanded, *even, glabrous, generally becoming fibrillose or slightly floccose-villose* on the disk, occasionally rimose, variable in color; lamellæ broad, somewhat ventricose, at first whitish, then flesh-colored; stem equal or slightly tapering upward, firm. solid, fibrillose or subglabrous, variable in color; spores broadly elliptical, .00025 to .00032 in. long, .0002 to .00025 broad.

Plant 2 to 6 inches high, pileus 2 to 4 broad, stem 3 to 6 lines thick.

Decaying wood in groves, borders of woods and open places.

This species, with us, is very common and very variable, yet it is not abundant. Usually but one or two specimens are found at a time. It grows especially on or about old stumps and prostrate trunks and may be found in wet weather from May to October.

The typical form has the pileus and stem of a dingy or brown color and adorned with blackish fibrils, but specimens occur with the pileus white, yellowish, cinereous, grayish-brown or blackish-brown. I have never seen it of a true cervine color. It is sometimes quite glabrous and smooth to the touch and in wet weather it is even slightly viscid. It also occurs somewhat floccose-villose on the disk, and the disk, though usually plane or obtuse, is occasionally slightly prominent or subumbonate. The form with the surface of the pileus longitudinally rimose or chinky is probably

due to meteorological conditions. The lamellæ, though at first crowded, become more lax with the expansion of the pileus. They are generally a little broader toward the marginal than toward the inner extremity. Their tendency to deliquesce is often shown by their wetting the paper on which the pileus has been placed for the purpose of catching the spores. The stem is usually somewhat fibrous and striated but forms occur in which it is even and glabrous. When growing from the sides of stumps and prostrate trunks it is apt to be curved. Two forms deserve varietal distinction.

Var. *albus*. Pileus and stem white or whitish.

Var. *albipes*. Pileus cinereous yellowish or brown; stem white or whitish, destitute of blackish fibrils.

In Europe there are three or four forms which have been designated as species under the names *A. rizens*, *A. patricius*, *A. eximius* and *A. petasatus*, but Fries gives them as varieties or subspecies of *A. cervinus*, though admitting that they are easily distinguished. None of these have occurred in our State. *A. atricapillus*, Batsch., *A. latus*, Bolt., *A. Pluteus*, Pers., and *A. Neesii*, Kl., are given as synonyms of *A. cervinus*.

### **Pluteus umbrosus, Pers.**

Shade-loving Agaric. Brown Pluteus.

Pileus fleshy, at first campanulate, then convex or expanded, *rugose wrinkled* and more or less villose on the disk, fimbriate on the margin, *blackish-brown*; lamellæ broad, somewhat ventricose, at first whitish, then flesh-colored, *blackish-brown and fimbriate or denticulate on the edge*; stem solid, colored like or paler than the pileus, fibrillose or villose-squamose; spores elliptical, .0003 in. long, .0002 broad.

Decaying wood and stumps, especially of pine, both in shaded and open places. Not rare.

This is similar in size and general appearance to the preceding species, from which it is readily distinguished by the rugose-villose disk of the pileus and the dark brown edge of the lamellæ. The color of the pileus is usually darker than in that species. I have not seen it with the margin fimbriate, though this is a prominent character of the species in Europe.

### **Pluteus granularis, Peck.**

Granular Pluteus.

Pileus convex or nearly plane, subumbonate, *rugose-wrinkled, granulose or granulose-villose*, varying in color from yellow to brown; lamellæ rather broad, crowded, ventricose, whitish, then flesh-colored; stem equal, solid, colored like the pileus, often paler at the top, *velvety-pubescent*, rarely squamulose; spores subglobose or broadly elliptical, .00025 to .0003 in. long, .0002 to .00025 broad.

Plant 1.5 to 3 inches high, pileus 1 to 2 inches broad, stem 1 to 2 lines thick.

Decaying wood and prostrate trunks in woods. Hilly and mountainous districts. June to September.

The species is closely related to the two preceding, but is readily distinguished from them by the peculiar vesture of the pileus and stem.

The granules are so minute and so close that they form a sort of plush on the pileus, more dense on the disk and radiating wrinkles than elsewhere. The clothing of the stem is finer, and has a velvety-pubescent appearance, but in some instances it breaks up into small scales or squamules. The color of the pileus and stem is usually some shade of yellow or brown, but occasionally a grayish hue predominates. The darker color of the granules imparts a dingy or smoky tinge to the general color. The disk is often darker than the rest of the pileus.

### **Pluteus nanus, Pers.**

#### **Dwarf Agaric. Mealy Pluteus.**

Pileus somewhat fleshy, thin, convex or nearly plane, obtuse, rugulose, *pulverulent or dingy-pruinose, brown*; lamellæ close, ventricose, white or yellowish, then flesh-colored; stem equal, solid, firm, striate, *glabrous*, white or yellowish; spores subglobose, .0002 to .00025 in. long.

Plant about 1 inch high, pileus 6 to 12 lines broad, stem 1 line thick.

Decaying wood and sticks. Not common nor abundant when it does occur. July to September.

The small size, dingy-mealy or pulverulent pileus and small subglobose spores are characteristic of this species. Small specimens sometimes have the margin of the pileus slightly striate. Large specimens may be distinguished from small forms of the preceding species by the glabrous stem. The European variety *lutescens*, which has the stem and lamellæ yellowish, has not yet been observed in our State. *Agaricus pyrrhospermus*, Bull. is given as a synonym.

### **Pluteus tomentosulus, Peck.**

#### **Woolly Agaric.**

Pileus thin, convex or nearly plane, subumbonate, *minutely villose or squamulose-tomentose*, white; lamellæ rather broad, rounded behind, crowded, white then flesh-colored; stem equal, solid, striate, *slightly pubescent or subtomentose*, white; spores subglobose or broadly elliptical, .00025 to .00032 in. long, .00025 broad, generally containing a single large nucleus.

Plant 2 to 5 inches high, pileus 1 to 3 inches broad, stem 2 to 4 lines thick.

Decaying wood and prostrate trunks. Catskill mountains and Gansevoort. July and August.

This rare but beautiful species appears to be the American analogue of the European. *P. pellitus*, Pers., which differs in its silky pileus and glabrous stem. The entire plant, when young, is pure white, but with advancing age the lamellæ assume the usual pinkish hue and the margin of the pileus is sometimes tinged with the same color.

### **Pluteus sterilomarginatus, Peck.**

#### **Sterile-margined Agaric.**

Pileus thin, broadly convex or expanded, with a minute close-pressed tomentum, pinkish-white, the thin *margin extending beyond the lamellæ*; lamellæ close, subventricose, minutely eroded on the edge, tapering



toward the outer extremity, pale flesh-colored ; stem short, equal, solid, glabrous, straight or curved, whitish ; spores *subglobose*, *angular*, .00025 in. broad, usually containing a single central nucleus.

Plant about 1 inch high, pileus 6 to 12 lines broad, stem .5 to 1 line thick.

Decaying trunks and sticks in woods. Portville. September.

This rare species has been found but once. It is much smaller and more delicate than the preceding, and easily distinguished by its thin margin projecting beyond the lamellæ and by the character of the spores. The pileus sometimes cracks in areas, and then it has the appearance of being coated with a thin, scaly paste.

### **Pluteus longistriatus, Peck.**

Striated Pluteus.

Pileus thin, convex or expanded, dry, *striate to the disk*, *cinereous or whitish*, the disk often darker than the margin and minutely squamulose or hairy ; lamellæ broad, ventricose, white, then flesh-colored ; stem equal, glabrous, white ; spores globose, .0003 in. broad.

Plant about 2 inches high, pileus 1 to 1.5 broad, stem about 1 line thick.

Decaying wood. Albany. July.

This species is well marked by the long striations of the pileus. It was discovered in one of the streets of Albany in 1876, but has not been observed since that time. The spores at first sight appear globose, but there is a depression on one side that gives them an orbicular or saucer shape.

### **Pluteus leoninus, Schæff.**

Lion-colored Agaric. Yellow Pluteus.

Pileus thin, campanulate, then convex or expanded, *even*, glabrous, moist or subhygrophanous, striate on the margin, yellow or reddish-yellow ; lamellæ rather broad, rounded behind, yellowish or yellowish on the edge, then flesh-colored ; stem equal, *solid*, slightly striate, white or yellowish, spores broadly elliptical, .00028 to .00032 in. long, .00025 broad.

Plant about 2 inches high, pileus 1 to 2 inches broad, stem 2 to 3 lines thick.

Decaying wood in forests. Adirondack mountains. August

This is a very rare species in our State. Its glabrous pileus and yellowish color distinguish it from all the foregoing species, its even pileus and solid stem, from the next following species.

### **Pluteus admirabilis, Peck.**

Admirable Pluteus.

Pileus thin, convex or expanded, generally broadly umbonate, glabrous, *rugose-reticulated*, moist or hygrophanous, striatulate on the margin when moist, often obscurely striate when dry, yellow or brown ; lamellæ close, broad, rounded behind, ventricose, whitish or yellowish, then flesh-colored ; stem slender, glabrous, *hollow*, equal or slightly

thickened at the base, yellow or yellowish-white, with a white mycelium; spores subglobose or broadly elliptical, .00025 to .0003 in. long, .00025 broad.

Var. *fuscus*. Pileus brown or yellowish-brown.

Plant 1 to 2 inches high, pileus 6 to 10 lines broad, stem .5 o t 1 line thick.

Decaying wood and prostrate trunks in forests. Common in hilly and mountainous districts. July to September.

This beautiful *Pluteus* is closely related to *P. chrysophlebius*, B. & R., a southern species, which, according to the description, has the veins of the pileus darker colored than the rest of the surface and the stem enlarged above and hairy at the base, characters not shown by our plant. It is also similar to the European *P. chrysophæus*, Schæff., but according to Fries that species is larger and has a more even pileus, which is constantly cinnamon-colored. The variety, which grows with the typical form, sometimes on the same prostrate trunk with it, differs only in color, and forms a connecting link between this species and the European, *P. phlebophorus*, Ditm., from which it is scarcely distinguishable, except by its smaller size, hygrophanous character and striatulate margin. Indeed all the species, together with *P. leoninus*, Schæff., differ from each other by such slight characters that their separation is unsatisfactory. It is quite possible that when the range of their variations is more fully investigated they will be found to constitute a single comprehensive and very variable species. In our plant small young specimens sometimes have the stem solid, but when fully developed it is hollow, though the cavity is small. This character, with its small size, distinguishes it from *P. leoninus*.



## EXPLANATION OF PLATE I.

### CERCOSPORA COMARI, *Peck.*

- Fig. 1. A leaflet spotted by the fungus.
- Fig. 2. A tuft of four flocci, two of them bearing spores, x 400.
- Fig. 3. Two spores, x 400.

### HADROTRICHUM LINEARE, *Peck.*

- Fig. 4. Upper part of a leaf bearing linear patches of the fungus.
- Fig. 5. A tuft of five flocci, two of them bearing spores, x 400.
- Fig. 6. Five spores, x 400.

### ENTYLOMA SANICULÆ, *Peck.*

- Fig. 7. A leaflet spotted by the fungus.
- Fig. 8. Five spores, x 400.
- Fig. 9. Four conidia, x 400.

### CYLINDROSPORIUM VERATRINUM, *S. & W.*

- Fig. 10. Upper part of a leaf bearing linear patches of the fungus.
- Fig. 11. A tuft of four flocci, two of them bearing spores, x 400.
- Fig. 12. Two spores, x 400.

### RAMULARIA OXALIDIS, *Farl.*

- Fig. 13. A leaflet spotted by the fungus.
- Fig. 14. A tuft of four flocci, two of them bearing spores, x 400.
- Fig. 15. Five spores, x 400.

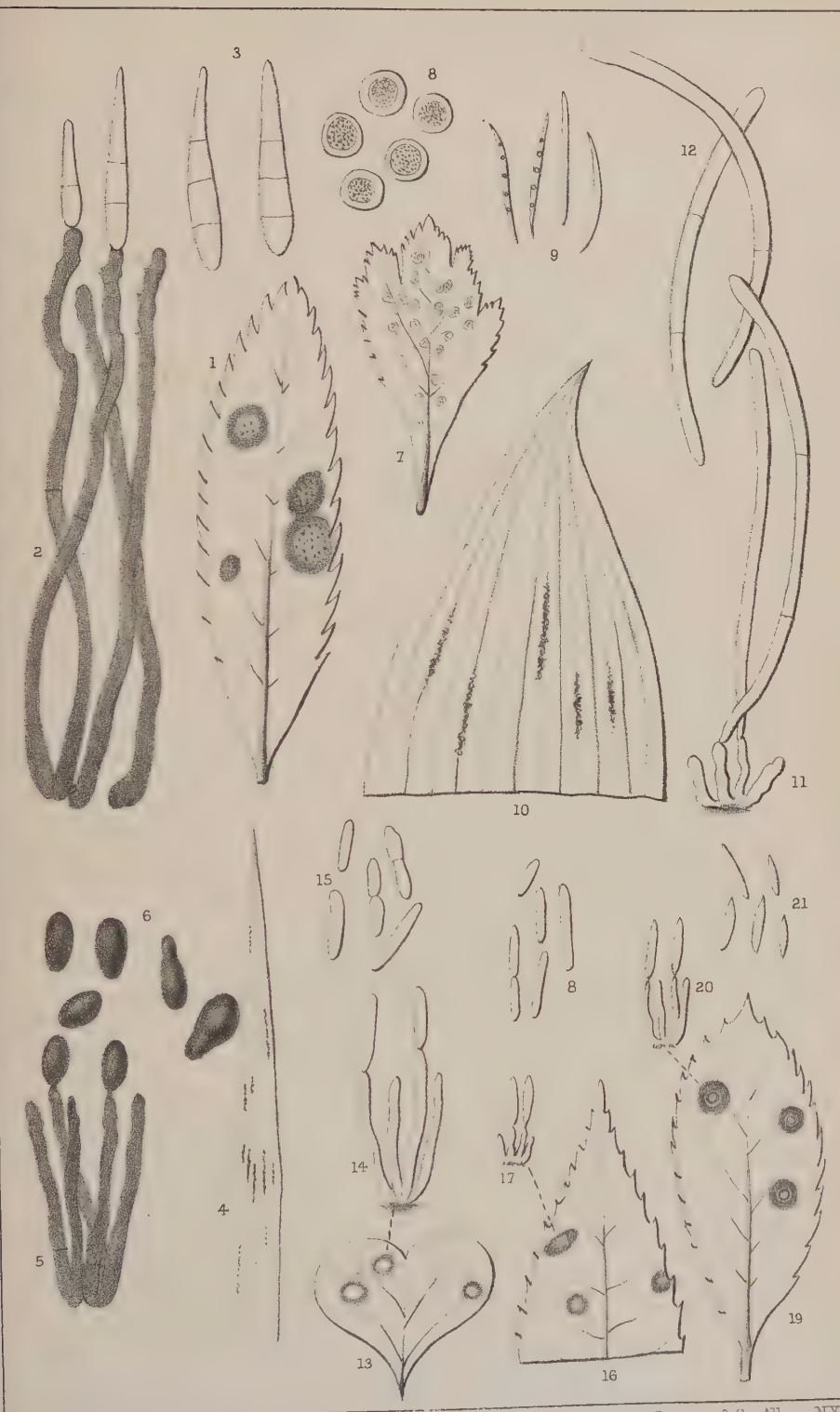
### RAMULARIA DIERVILLÆ, *Peck.*

- Fig. 16. Upper part of a leaf spotted by the fungus.
- Fig. 17. A tuft of four flocci, two of them bearing spores, x 400.
- Fig. 18. Six spores, two of them united end to end, x 400.

### RAMULARIA PRINII, *Peck.*

- Fig. 19. A leaf spotted by the fungus.
- Fig. 20. A tuft of four flocci, two of them bearing spores, x 400.
- Fig. 21. Five spores, x 400.









## EXPLANATION OF PLATE II.

### OVULARIA MONILOIDES, *E. & M.*

- Fig. 1. A leaf spotted by the fungus.
- Fig. 2. A branchlet with the central part frosted by the fungus.
- Fig. 3. A tuft of four flocci, two of them bearing spores, x 400.
- Fig. 4. Seven spores, x 400.

### AGARICUS (INOCYBE) COMATELLUS, *Peck.*

- Fig. 5. Four plants of usual size.
- Fig. 6. Vertical section of a pileus and the upper part of its stem.
- Fig. 7. A cystidium, x 400.
- Fig. 8. Five spores, x 400.

### ASCOCHYTA COLORATA, *Peck.*

- Fig. 9. A leaflet spotted by the fungus.
- Fig. 10. Five spores, x 400.

### ASTERINA NUDA, *Peck.*

- Fig. 11. Tip of a branchlet with three fungus bearing leaves.
- Fig. 12. A leaf showing the fungus on the lower surface, magnified.
- Fig. 13. A leaf showing the fungus on the upper surface, magnified.
- Fig. 14. An ascus containing spores, x 400.
- Fig. 15. Four spores, x 400.

### LEPTOSPHERIA LYCOPODIICOLA, *Peck.*

- Fig. 16. Piece of a branch bearing the fungus.
- Fig. 17. A perithecium and its matrix, magnified.
- Fig. 18. Two paraphyses and an ascus containing spores, x 400.
- Fig. 19. Four spores, x 400.

### LEPTOSPHERIA CORALLORHIZÆ, *Peck.*

- Fig. 20. Piece of a stem, bearing the fungus.
- Fig. 21. A perithecium and its matrix, magnified.
- Fig. 22. A paraphysis and two asci containing spores, x 400.
- Fig. 23. Four spores, x 400.

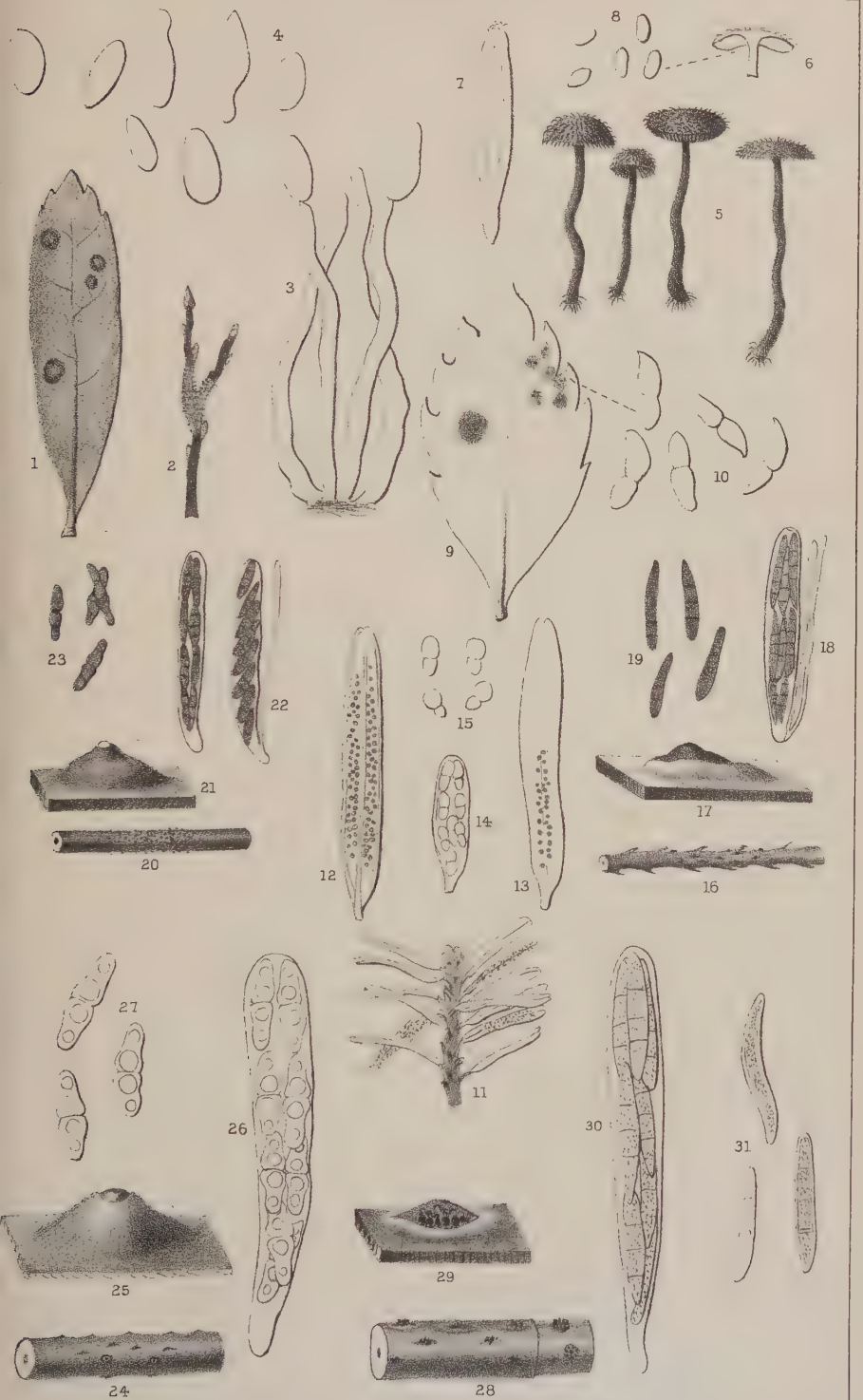
### METASPHERIA MYRICÆ, *Peck.*

- Fig. 24. Piece of a branch bearing the fungus.
- Fig. 25. A perithecium and its matrix, magnified.
- Fig. 26. An ascus containing spores, x 400.
- Fig. 27. Three spores, x 400.

### CRYPTOSPORA CARYÆ, *Peck.*

- Fig. 28. Piece of a branch bearing the fungus.
- Fig. 29. A pustule and its matrix, magnified.
- Fig. 30. An ascus containing spores, x 400.
- Fig. 31. Three spores, x 400.









### EXPLANATION OF PLATE III.

#### APPENDICULARIA ENTOMOPHILA, *Peck.*

- Fig. 1. Leg of a fly bearing the fungus, magnified.
- Fig. 2. A perithecium and its appendages more highly magnified.
- Fig. 3. Tip of the perithecial rostrum with spores escaping from its apex, x 400.
- Fig. 4. Three spores, x 400.

#### SPHÆROGRAPHIUM HYSTRICINUM, *Sacc.*

- Fig. 5. Piece of bark bearing the fungus.
- Fig. 6. A perithecium with spores escaping from its apex, magnified.
- Fig. 7. Four spores, x 400.

#### ASCOCHYTA CASSANDRÆ, *Peck.*

- Fig. 8. A leaf spotted by the fungus.
- Fig. 9. A perithecium and its matrix, magnified.
- Fig. 10. Five spores, x 400.

#### VENTURIA CASSANDRÆ, *Peck.*

- Fig. 11. A leaf spotted by the fungus.
- Fig. 12. Two perithecia, magnified.
- Fig. 13. An ascus containing spores, x 400.
- Fig. 14. Four spores, x 400.



